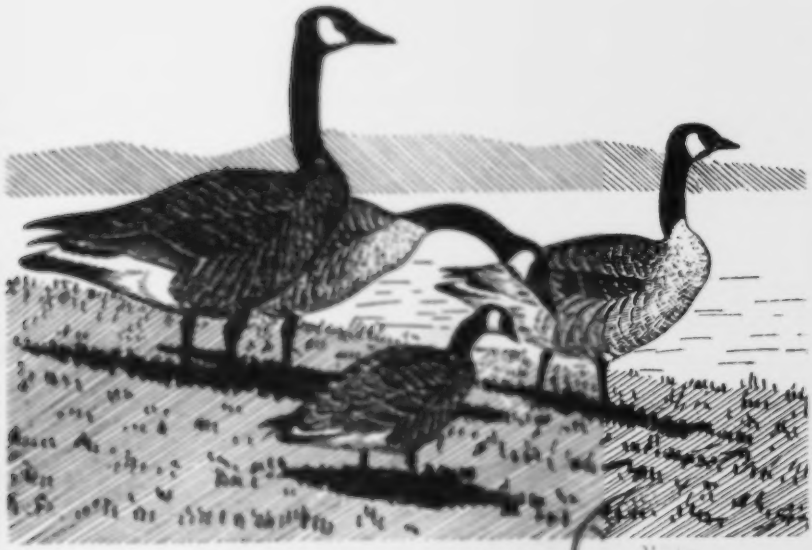
B.C. Prov. P

BRITISH COLUMBIA PROVINCIAL MUSEUM
DEPARTMENT OF EDUCATION

HANDBOOK No. 15



THE BIRDS
OF BRITISH COLUMBIA
(6) Waterfowl

By C. J. Guiguet
Illustrations by Frank L. Beebe

ONTARIO
1958

VICTORIA, B.C. DECEMBER, 1958

BRITISH COLUMBIA PROVINCIAL MUSEUM
DEPARTMENT OF EDUCATION

HANDBOOK No. 15

THE BIRDS
OF BRITISH COLUMBIA
(6) Waterfowl

By C. J. Guiguet
Illustrations by Frank L. Beebe

Printed by Don McDiarmid, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1958

BRITISH COLUMBIA
DISTRICTION MAP
Scale of Miles
0 50 100 200
ALASKA
QUEEN CHARLOTTE SOUND
PACIFIC OCEAN
VANCOUVER
VICTORIA
PRINCE GEORGE
KAMLOOPS
NANAIMO

CONTENTS

	Page
Introduction	5
Swans	7
Whistling Swan	7
Trumpeter Swan	10
Geese	13
Canada Goose	13
Black Brant	17
Emperor Goose	20
White-fronted Goose	22
Snow Goose and Ross Goose	25
Dabbling Ducks	29
Mallard	29
Gadwall	31
Pintail	33
Green-winged Teal	35
Cinnamon and Blue-winged Teal	37
Shoveller	40
Baldpate and European Widgeon	42
Wood Duck	44
Diving Ducks	47
Redhead	47
Canvas-back	49
Ring-necked Duck	51
The Scaups	53
American and Barrow Golden-eye Ducks	56
Buffle-head	59
Old Squaw Duck	61
Harlequin Duck	63
King Eider	65
Pacific Eider	67
White-winged Scoter	69
American and Surf Scoters	70
Ruddy Duck	74

PAGE

Mergansers 77
American Merganser 77
Red-breasted Merganser 79
Hooded Merganser 81

Extralimital 83
Fulvous Tree Duck 83
Steller Eider 84

References 84

Waterfowl

INTRODUCTION

This handbook deals with all species of swans, geese, ducks, and mergansers known to occur in the Province of British Columbia. As it is designed for school-children, novices, amateur bird-watchers, and hunters, Latin names and technical terms have not been used except when necessary.

Swans, geese, ducks, and mergansers are grouped in one order of birds known as the sieve-billed swimmers. All are characterized by having three toes webbed and with lamillæ on the sides of the bill. The lamillæ vary, being tooth-like projections in the mergansers and sieve-like structures in the others, and the bill is armed at the tip by a flattened or hook-like nail.

Swans are very large white waterfowl, easily recognized at a glance. Geese differ from ducks in being larger, and in having the legs more centrally placed on the body. The bill is less flattened than in the ducks and the sexes are coloured alike. With ducks the male is usually brightly coloured compared to the female, which is usually drab. Ducks may be divided nicely into three groups—the pond or dabbling ducks, the diving ducks, and the mergansers or fish ducks. Dabblers feed largely on the land, in wet fields or marshes, and in shallow waters where they can reach the bottom by tipping up, if necessary. On take-off they leap straight from the water and are air-borne at once. The legs are placed more centrally on the body than in the divers and the hind toe is small and without a lobe. Diving ducks, on the other hand, feed by diving for their food, a great percentage of which is animal matter. They frequent larger bodies of water as a general rule and many of them live on the sea; compared to the dabblers, they are awkward on land and, apart from nesting, spend most of their time on the water. They are incapable of jumping into flight; most run and flap for a considerable distance before taking off. The legs are placed well back on the body and the hind toe is enlarged and with a lobe.

Mergansers or sawbill ducks, as they are commonly called, live largely upon fish, which are seized in underwater pursuit. The prominent tooth-like lamillæ, previously mentioned, furnish a positive identification to this group of birds; otherwise, their characteristics are somewhat similar to those of the divers.

We are indebted to Mr. Seth R. Halton, publisher of the Victoria Daily Colonist, for certain of the plates used as illustrations.

104-03917/

Whistling swan.

SWANS

Whistling Swan

The whistling swan nests in the far north, mainly north of the Arctic Circle. It winters largely along the Atlantic and Pacific seaboards of the United States. In the west it winters from Alaska south, and though we have wintering records for the British Columbia coast, and for the interior during mild winters, most of the population winters to the south of this Province. The migratory movement northward begins in March and continues through April and May. In the fall the birds begin to leave the breeding-grounds during September, and by the end of October most of them have arrived or are well on the way to the wintering-grounds.

In migration this bird often flies at great height and can easily be missed by the casual observer even though it often moves in large flocks. Apparently the majority of the birds from the western Arctic migrate first eastwards, then southward down the main migratory routes east of the Rockies, but occasional large flocks pass down the British Columbia coast. In 1945 the late Ronald Stewart, of Masset, reported very large numbers of migrating swans on the sea north of that village. Periodically " whistlers " appear in small numbers around the mouth of the Fraser River and at the south end of Vancouver Island. Three wintered at Victoria in 1952, and were reported as trumpeter swans for some time before Museum personnel investigated and found them to be the other species. Strangely enough these particular birds were quite fearless, a characteristic associated with the trumpeter swan. Most swans seen wintering on the southern coast-lines are recorded as trumpeters, but correct identification requires close scrutiny, rather than an assumption of species based on time and place.

Swans are said to mate for life, taking new mates only on the death of one of the pair. The female usually lays four or five large, dull, creamy-coloured eggs which hatch out in late June or early July after an incubation period of thirty-five to forty days. The young grow rapidly and by September are ready for the long flight southward.

The whistling swan feeds largely upon vegetable material, most of which is taken in the water. It is capable of securing food at considerable depths by tipping up and extending its long neck. Pond weeds and the fronds, stems, and roots of other aquatic plants are taken.

Much has been written in folk-lore and poetry of the song of the dying swan, and the term " swan song " is commonplace in our everyday talk. It implies the end—finis—death. Most ornithologists, including ourselves, believe that this is pure fiction. Kortright, however, in his " The Ducks, Geese and Swans of North America," has this to say:—

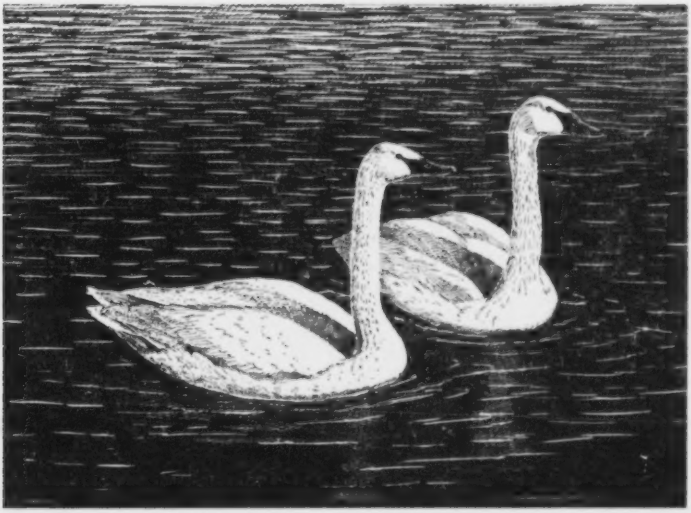
" The ancients called the Swan, The Bird of Apollo, or of Orpheus, and ascribed to it remarkable musical powers, which it was supposed to exercise particularly when its death approached.

Down the ages ' The Song of the Dying Swan ' or the ' Lament of the Swan,' has been referred to in literature, and is a phrase familiar to everyone. In the Dialogues of Plato, Socrates, born 469 B.C., referring to the swans, says: '. . . when they perceive that they must die, having sung all their life long, do then sing more than ever, rejoicing in the thought that they are about to go away to the god whose ministers they are. But men, because they are themselves afraid of death, slanderously affirm of the swans that they sing a lament . . . I do not believe this to be true . . . they sing and rejoice in that day more than they ever did before.' "

On the other hand, Dr. Elliott Coues, famed ornithologist, in his " Key to North American Birds " (1887), says of swans: ". . . it is hardly necessary to add, that their fancied musical ability, either in health or at the approach of death, is feigned by poets but not confirmed by examination of their vocal apparatus . . . there are no . . . muscles nor other apparatus for modulating the voice musically."

Dr. D. G. Elliot (1898), a reliable observer and celebrated naturalist, relates: " I had killed many swan and never heard aught from them at any time, save the familiar notes that reach the ears of everyone in their vicinity. But once, when shooting in Currituck Sound over water belonging to a club of which I am a member, in company with a friend, Mr. F. W. Leggett, of New York, a number of swan passed over us at a considerable height. We fired at them, and one splendid bird was mortally hurt. On receiving his wound the wings became fixed and he commenced at once his song, which was continued until the water was reached, nearly half a mile away. I am perfectly familiar with every note a swan is accustomed to utter, but never before nor since have I heard any like those sung by this stricken bird. Most plaintive in character and musical in tone, it sounded at times like the soft running of the notes in an octave, and as the sound was borne to us, mellowed by the distance we stood astonished and could only exclaim, ' We have heard the song of the dying swan.' "

On the whole, however, most ornithologists believe the so-called " swan song " belongs in the realm of mythology.



Trumpeter swan.

Trumpeter Swan

The trumpeter swan, largest of all North American waterfowl, often weighs over 20 pounds and measures up to 6 feet in length. In adult plumage it is snow white throughout, although sometimes a rust stain is apparent about the face, neck, and breast. This stain accumulates on the plumage while the bird is frequenting certain waters where the mineral content is high. It is not of uncommon occurrence in many other waterfowl, but shows up more plainly on birds of white plumage.

There is no difficulty in identifying a swan as such, but it is often difficult to separate the trumpeter from the whistler.

From the European mute swan, which has been introduced in this Province, our native swans differ in wing and neck carriage when on the water. The mute usually carries the folded wing raised up in "sail effect" and the neck gracefully curved. The

North American swans carry the wing closely appressed to the body and the neck straight. The mute swan, especially the male, has a prominent knob at the base of the bill, which North American swans do not have.

The adult whistling swan is smaller than the trumpeter, usually weighing under 20 pounds and measuring about 50 inches from bill-tip to the end of the tail. The black bill of the adult whistling swan often has a yellow spot on the side at the base. In young birds this is sometimes much more prominent, extending over a large part of the upper mandible. Trumpeter swans, both young and old, have a totally black bill, but keep in mind that some whistling swans, both young and old, also have totally black bills. The legs and feet of the whistling swan are black; those of the trumpeter, especially when young, have a yellowish tinge, which dulls to a putty colour with age. Specimens in hand may be identified by the sternum or breast-bone, which, when dissected out, shows a pronounced bulge on the upper side in the trumpeter, a feature lacking in the whistling swan. This bulge is caused by a vertical loop in the windpipe of the larger bird. The nostrils of the whistling swan are situated closer to the tip of the bill than to the eye; in the trumpeter the nostrils lie farther back, but this, too, is a variable characteristic.

The young of both species have grey plumage throughout the first year, usually acquiring adult plumage during the next two years. Captive swans have been known to acquire full adult plumage within fifteen months, while some observers claim it takes as long as five years in wild birds. It seems probable that moult into full adult plumage varies greatly with individuals and with food conditions and other factors.

The introduced mute swan is not mute, the whistling swan does not whistle, and, in my opinion, trumpeter swans do not trumpet. For the large part, these birds are silent, especially when on the water, but when heard the notes are distinctive. The mute makes a peculiar barking noise on occasion, and hisses much like a domestic goose does when annoyed. The whistling swan has a variety of honkings and whoopings which are difficult to describe. When in large numbers they sound much like a group of dogs yapping and

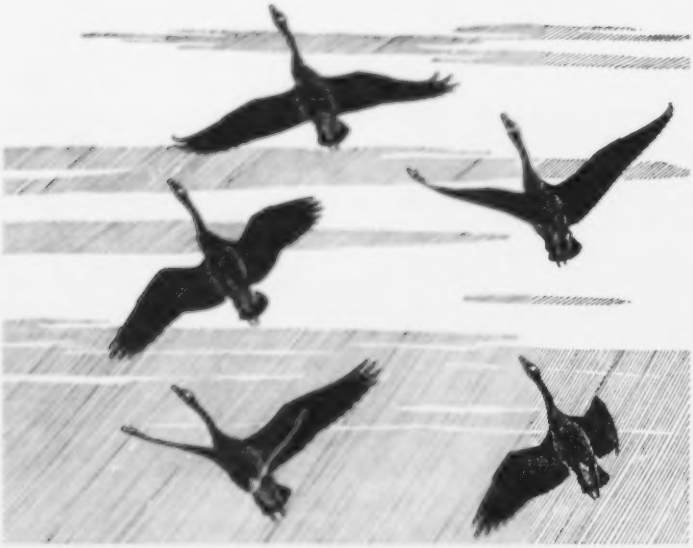
barking. Trumpeters I have heard on only one occasion, and these were making a low resonant honking noise, which, while clearly heard at a distance, did not seem to possess a great deal of volume; that is, it was not a loud trumpeting sound. Of the three kinds of swans, the whistler is the noisiest, and any flock giving forth with many calls can be safely identified as of that species.

The trumpeter swan is less wary than is the whistler, and it is claimed by some that this has contributed to its reduction in numbers. However, it seems the logical explanation for the comparatively small numbers is that the breeding range has been reduced. The trumpeter winters as far north and nests as far south as conditions allow, while the whistler winters in the south and nests in the high north. The agricultural pursuits of man have eliminated much of the breeding-grounds of the trumpeter, while the breeding range of the whistling swan is virtually undisturbed. Therein I believe lies the answer, although some claim that trumpeter swans never were really numerous. While dangerously low in numbers, trumpeters are still found throughout most of British Columbia, and a number of areas on the coast and coastal islands are regular wintering-grounds for the species. Wintering flocks occur in the interior as well, when weather conditions permit.

At present the location of the breeding-grounds for this bird is not publicized, but apparently it nests throughout its range, for breeding populations occur south in the Yellowstone area of Montana and north in the Grande Prairie region of Alberta. As far as is known, there is no authentic breeding record for this Province.

The nest is a large structure made up of tules or other coarse aquatic vegetation, and sometimes the top of a muskrat or beaver house is utilized as a nesting-site. The eggs are large, measuring some 4½ inches long. They are whitish in colour, much like those of the whistling swan.

The trumpeter swan feeds upon a variety of aquatic plants. In areas where it is fed by the Wildlife Service, barley deposited in the water is readily taken.



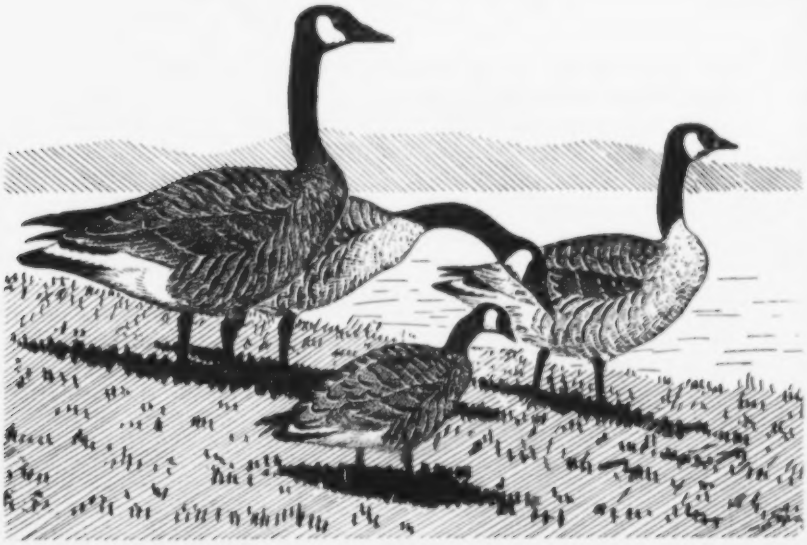
Canada goose.

GEESE

Canada Goose

Five kinds or subspecies of the Canada goose are generally recognized in North America, although several additional subspecies have been proposed recently. Four of these five basic forms occur within the Province. These are separated mainly on the basis of size, colour, and voice and on size and shape of the bill. In common they all have a black neck and head with the white cheek patch which characterize the Canada geese.

In addition, all have the snowy-white coverts above the tail. The back is dark and the wing and tail feathers are black; the breast and flanks vary from dark chocolate brown to a light pearly



Canada goose.

Western. Honker. Cackling. Lesser.

grey. Generally speaking, the birds occurring on the coast are essentially brown, much darker than the races occurring in the interior, in which the contour feathers are grey.

We may separate the British Columbia Canada geese by size and colour. First, the " honker " (*Branta canadensis canadensis*) (left rear) is found inland, breeding and migrating throughout the interior where suitable habitat occurs. This is the largest of our Canada geese, weighing from 8 to 15 pounds. It has the typical markings and is a grey, black and white bird. The usual call is a sonorous rolling " whonk," which is easily imitated but difficult to describe. Also, this bird has a wide range of notes, which vary from faint murmurings, when the bird is feeding or in flight, to a loud medley of gabblings when it is pitching in to land with birds already on the ground. The birds on the ground also gabble at the incoming flock, and a wide variety and considerable volume of

noise is produced. A hunter in the blind cannot reproduce this "flock noise," and wary honkers pitching in to the decoys often break off well out of range, due to the utter silence or unnaturalness of the single artificial call which issues from the set. At other times, flocks will pitch right in regardless of noise, dogs, or visible hunters; these occasionally return even after several birds have been taken from a flock on the first approach, but while I've had this occur on a few occasions I regard such behaviour as unusual. As a rule, honkers are wary birds and are exceedingly difficult to decoy.

The geese resident at Elk Lake on the south end of Vancouver Island are of this subspecies. About a dozen birds were placed there some years ago by Game Warden Jones and the late J. A. Munro, then Dominion Wildlife Officer. The birds have increased in numbers, and we have recorded as many as 200 on occasion at Elk Lake. They trade back and forth to Quamichan Lake, and feed in surrounding fields on the Saanich Peninsula. These geese nest and raise their young in the vicinity of both lakes and other small lakes in the area.

During migration the mouth of the Fraser River is sometimes frequented by this subspecies, and it is said to winter sometimes at the heads of longer inlets on the mainland coast.

The western Canada goose (*Branta canadensis occidentalis*) (left front) is fully as large as the honker but differs in being a very dark brown bird. It is often called the white-cheeked goose, but as all of the group have white cheeks, this term is misleading. The western Canada goose is restricted in distribution to the narrow coastal belt and islands. It occurs along the length of the coast from Alaska south to Washington. In the winter a few straggle down the Washington and Oregon coasts, but this bird is largely resident along the British Columbia coast and islands. It remains the year around in many areas, raising young and wintering in the same locale. Otherwise, in behaviour, it is much like the "honker."

The lesser Canada goose (*Branta canadensis leucopareia*) (far right) is noticeably smaller than the honker and western Canada goose. It weighs, on the average, about 6 pounds, and has a proportionately shorter neck and a much smaller bill than do the larger

birds previously mentioned. In addition, the call is more highly pitched, though alike in other respects. In colour most of these birds are similar to the big grey honker, but on the coast in winter we have a dark chocolate-brown bird of equal size, and with a similar call—a bird which, in the opinion of many, is a western race of the lesser Canada goose as yet undescribed.

These birds nest in the high north, from Alaska to Hudson Bay, and the pale interior form winter in the Sacramento Valley, Mexico, and along the shores of the Gulf of Mexico. They are not as abundant as the other subspecies occurring here.

The cackling goose (*Branta canadensis minima*) (centre foreground) is small and dark with brown body feathers and weighs about 4 pounds or less. It is confined chiefly to the west coast, nesting in extreme north-western Alaska and wintering in California. Its high-pitched squealing call and small size make identification easy.

The cackler, the lesser Canada, and the honker are all seen in migration along the coast. They move northward in May and June and return in late August, September and October. In the interior the cackling goose is uncommon, although I have seen it occasionally in the western sections (Quesnel). The lesser Canada and the big grey honker are seen regularly in the interior—the former to a lesser extent and as a migrant only, and the honker as both breeding and migrant. Western Canada geese are present the year around along the west coast of Vancouver Island, the Queen Charlottes, and other northern islands, and at the head of the mainland inlets.

The oft-reported Hutchins' or Richardson's goose does not occur in British Columbia. It nests in the eastern Arctic and winters along the Gulf of Mexico, migrating to and fro through the interior of the continent. It is a small goose, slightly larger than the cackler but much lighter in colour. I think most people who report these birds to the Museum are confusing it with the lesser Canada or perhaps the cackling goose.

All of these geese feed upon aquatic plants, eating the fronds, stems, and roots. Where grass is available, they graze and crop it short to the ground. In agricultural areas they have learned to

feed upon grain and other crops, a diet which renders their flesh most palatable.

The breeding behaviour of these various subspecies is somewhat similar. Usually the birds construct a nest on the ground and fairly close to water. The honker and the western Canada goose, however, are known to nest far from the water on occasion, and sometimes on pilings and even in abandoned osprey nests at considerable heights. The eggs of the various subspecies are much alike, olive-coloured, and varying slightly in size with the subspecies. Grey down plucked from the breast of the female is used to cover the eggs and line the nest.

From four to six eggs make up a clutch; the young are precocial, foraging with the parent birds shortly after hatching. The time of hatching varies with latitude. Canada geese are excellent parents; both attend the young and will risk death to protect them from harm. The downies eat insects and tender shoots of aquatic plants to start. They grow quickly, and by fall, though smaller than the parent birds, they are ready for migration.

Black Brant

The black brant is a small dark-coloured goose which, under normal conditions, confines itself almost entirely to the sea and its shores. Its weight ranges from 3 to 6 pounds, depending upon condition, age, and individual variation.

The head, neck, breast, tail and flight feathers are black; the back and upper abdomen are a smoky brownish-black. The lower abdomen and tail coverts, both upper and lower, are white. In addition, the dark contour feathers of the flank are edged in white, a feature which shows at a considerable distance.

As in Canada geese, the white upper tail coverts give a white " U " effect on the rump when the bird is in flight. This goose lacks a white cheek patch but has an interrupted white neck band immediately below the head.

In flight, brant travel in flocks of varying size, and usually at low levels. The flock appears as an undulating line in the distance, bunching up first at one side then on the other. The line ripples

Black brant.

and waves as individual birds gain and lose a little altitude, and all the while the whole line seems to climb and descend as the flock moves along. The wings appear to be set well back in the body, and the leading edge slopes back sharply, a feature by which brant may be identified at a great distance.

Very often people confuse flighting pelagic cormorants (shags) with black brant. Both have that peculiar, low, undulating flight; the birds are of a size, and their flocking habits are much alike. Also, both species are moving actively at the same season. However, the brant has a slower wing beat and the wings slope back. These features are sufficient to separate the two in flight.

The common call of this goose is a low grating " crrr-onk," but often a sharper cry, resembling the yelp of the cackling goose, is heard. Unlike most of our other native geese, the cry of the black brant has no great volume, and a flock must be relatively close before it can be heard distinctly.

Brant (above). Cormorants (below).

The black brant nests along the shores of the western Arctic, never far from the water. It lays from four to eight olive-coloured eggs in a well-constructed nest filled with down. The eggs are laid in June, and by mid-September the young are ready for the long flight to the California and Mexican coasts. The southward migration passes by well out to sea and is seldom observed by British Columbians.

However, a few small flocks pass down the inside passage and some birds winter as far north as the Queen Charlotte Islands. No doubt small numbers are scattered along the coast during the winter months, and there is a wintering population at Boundary Bay on the lower mainland and at various points along the coast of Washington.

The bulk of the population, however, winters off the coast-lines of Oregon, California, and Mexico. In the spring the brant move northwards, small numbers showing along the British Columbia coast in January and February as a rule, but continuous flocks stream by close to shore in March, April, and early May, stopping to feed at various points all along our coast-lines.

Non-breeding birds are occasionally seen throughout the summer; several records have been secured at Comox, on the Goose Islands, and at other coastal points at this season.

Eel grass is the staple diet of the black brant, and without it there is little doubt that a large part of the present population would disappear. A variety of other marine plants is eaten, notably green algæ, including "sea lettuce," which grows on the surf-washed rocks.

When herring spawn has become attached to the plants eaten by brant, it, of course, finds its way into their craw, and such brant make poor table fare; normally, however, the flesh is palatable.

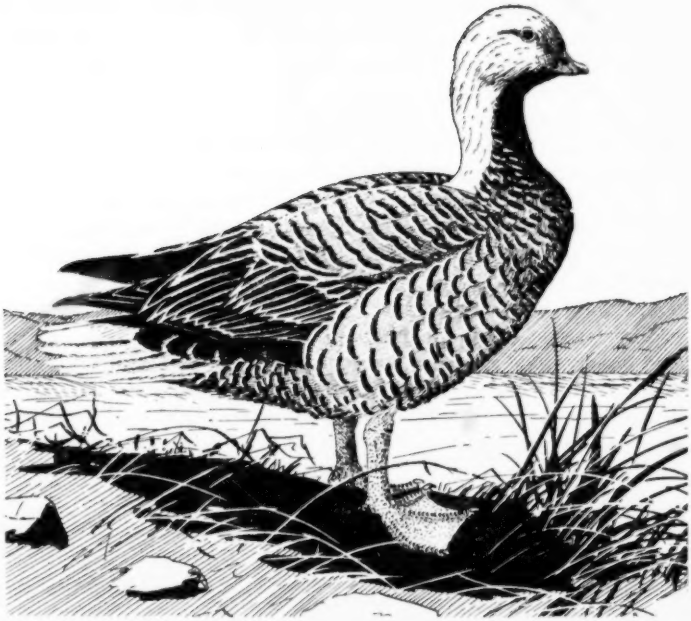
The brant decoys well on most occasions, and is among the fastest flying of the geese. For these reasons it ranks very high with waterfowlers. Sometimes it reacts to the roar of guns with great unconcern, the shot-up flock returning again and again and sometimes even sitting in with the decoys. On other occasions the first movement in the blind brings on such a burst of speed and erratic flight that even expert shots miss their target. Most waterfowlers, however, maintain that brant are the least wary and most easily secured of all the geese.

On the Atlantic coast of North America and in the Old World the brant has a much lighter coloured abdomen, which contrasts sharply with the black breast. Occasionally such light-coloured birds appear on this coast, but some doubt exists as to whether this is a specific character or merely individual variation in western birds.

Boundary Bay, Sooke Harbour, Oak Bay, Sidney Island, Qualicum, and Comox Bay are all favourite stopping-places for these geese, but when the heavy migration is on, they may be seen passing by from almost any headland on the coast.

Emperor Goose

The Emperor goose is rare in British Columbia, occurring with some regularity only as winter visitant to the Queen Charlotte Islands. In the more southern coastal areas of British Columbia single birds have been recorded at Egg Island, Cape Scott, Chemainus, mouth of the Fraser River, Estevan Point, and at Discovery Island near Victoria. These records range through the months of November to March. The Discovery Island bird was



Emperor goose.

taken by Mr. Percy Pike on March 26th, 1943, at the Museum's request, and is now one of three specimens in our collections.

This goose nests in the high north along the north-western coast of Alaska, north-eastern Siberia, and on some islands in the Bering Sea. The main wintering-grounds border the Aleutian chain, but the late R. M. Stewart, of the Queen Charlotte Islands, recorded small numbers at Masset Inlet each winter from 1940 to 1947, which seems to indicate regularity.

As in our other geese, the sexes are alike in plumage; the body is grey primarily, but each feather has a black bar and white terminal edging which gives the bird a delicately barred appearance at close range. The head and neck are white on the top, back,

and sides, while the throat is black. The tail is white, with coverts similar in colour to the body plumage. Feet and bill are predominantly yellow, although the latter has black edgings around the nostril and cutting edge.

As I have never seen this bird alive, I must refer to specimens on hand and to the literature. I can find no weights recorded, but judge the weight from the skins here to be in the neighbourhood of 6 pounds. The body is chunky, neck short and thick, and in flight this bird is said to have a more rapid wing beat than any of the other geese. The flight has been likened to that of the black brant, but " not so agile."

Like the black brant, this bird is essentially maritime in habit, seldom leaving the immediate environs of the sea. It is said to feed mainly upon animal matter, such as mussels, clams, and other shell-fish, to a greater degree than upon plants. For this reason the flesh is believed to be inferior to that of other geese, and is recorded as having a " strong rank odour."

The Emperor goose may be confused only with the blue goose, a bird which occurs normally only in the eastern sections of the continent. At any rate the blue goose is easily distinguished from the Emperor by the all-white neck, head, and throat.

White-fronted Goose

The white-fronted goose has no less than twenty-eight colloquial names, three of which are in common use in British Columbia—viz., California grey, yellow-legs, and speckle belly.

Actually the names listed here typify the bird, as adults have a white forehead, with the white extending down the side of the face immediately behind the bill—hence the " white-fronted." It is greyish-brown above in general body colour and a large part of the population winters in California—thus the name California grey. The legs are bright yellow in colour and there are broad irregular black markings on the breast and abdomen of the adult, and from these characteristics the terms yellow-legs and speckle belly have evolved.

It is a medium-sized bird, weighing in the neighbourhood of 5 or 6 pounds.

White-fronted goose.

(Immature.) (Adult.)

The flight feathers of the wings are black; the secondary coverts are brown edged in white, while the primary coverts and quills are grey. It has white coverts above and below a black tail, so that in flight a white " U " pattern shows on the dorsal side, much as it does in the Canada goose and black brant. Young birds lack the white front and speckled belly, and in general ground colour they appear darker below than do adult birds.

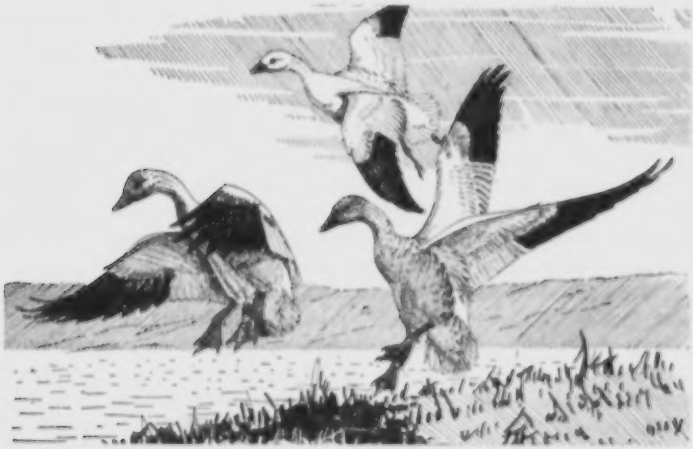
In North America this species nests across the western Arctic, but populations occur in Greenland and across northern Europe and Asia, so that actually it is circumpolar in breeding distribution. It arrives on its breeding-grounds early, and eggs may be found as early as May 27th (Nelson, 1887, in Bent, 1923). After mid-June the young begin to hatch. From four to seven creamy-coloured eggs are laid in a well-constructed nest close to the water. As with other waterfowl, down plucked from the female's breast covers the eggs. Fall migration begins early in September and October. The return movement northward takes place during March and April. It is seen across the Great Plains in large numbers during spring and fall migrations, but in British Columbia the chief flyway appears to be along the coast, for the white-front is is uncommon in the interior.

Occasionally a few white-fronts winter on the south end of Vancouver Island and along the Fraser River estuaries, where they tend to frequent fresh-water ponds. They show in small numbers on migration at Rocky Point, Elk Lake, and along Martindale Road on the Saanich Peninsula. On the lower mainland I've seen them at Lulu Island, Canoe Pass, and on the flats at Fry's Corner.

The call of the white-front is a long resonant, rapidly repeated cackle which resembles laughter, and it is distinctive. During migratory periods, flocks are often heard passing over by night, and though small numbers are actually seen, a fairly large migration is believed to pass along the British Columbia coast.

This goose eats vegetable matter mainly, although snails and aquatic insects and their larvæ have also been taken from the crop. On the breeding-grounds the tender blades of grasses, aquatic plants, and, in the latter part, berries make up the diet. In winter and on fall migration it frequents agricultural lands, feeding on a wide variety of grains and other crops.

The white-fronted goose is not an important game bird in British Columbia, but on the Great Plains and in the Sacramento Valley it is numerous and furnishes exciting sport for many hunters.



Ross goose (upper) and snow goose.

Snow Goose and Ross Goose

The two birds pictured in the foreground here are lesser snow geese, commonly known as "wavies"; the bird in the background is the smaller Ross goose. Both occur in British Columbia, but the Ross goose is uncommon, recorded only as a straggler.

The plumage of the adult lesser snow goose is white throughout, except for black wing-tips, but many birds wintering on this coast have a good deal of rust stain about the head and neck. The feet are pink, as is most of the bill, but the latter has a dark "grinning patch" on the side, a feature which aids in distinguishing this species from the Ross goose.

The lesser snow goose weighs up to 6 pounds, but birds wintering on the British Columbia coast often weigh less, especially during periods of prolonged frost. Many of the birds taken at the mouth of the Fraser are extremely thin, weighing in the vicinity of 4 pounds, whereas the same birds on the Great Plains or in the south, where their food is more nutritious, weigh closer to 6 pounds.

The young snow goose has grey plumage during its first year and attains the white adult plumage by the following summer otherwise it resembles the adult bird.

This goose nests in the Arctic from northern Alaska east to Baffin and Southampton Islands. It lays from four to eight, usually six, creamy-white eggs in a nest situated close to the water. Downy young hatch after an incubation period of twenty-two days and by September the young are ready for southward migration. As with other geese, both parents tend the young; the female does the incubating, the male standing guard.

In the eastern part of the breeding range the lesser snow goose and the blue goose intermingle and are recorded as interbreeding. There is no doubt that these birds are very closely related, and many believe that they are of the same species. In the western portion of the range, however, no blue goose colour variation occur, apart from an introduction made to Stanley Park some years ago. These birds, a pair of typical blue goose coloration, produced young of both snow goose and blue goose appearance. Some of these birds are believed to have escaped. A blue goose recorded at Seattle in recent years is said to have been one of these birds.

The snow goose winters in the Sacramento Valley, in the Gulf of Mexico, and at the mouths of the Fraser and Skagit Rivers near the 49th parallel. In the northern wintering area some 20,000 individuals have been recorded, about 3,000 of which frequent the Fraser delta as a rule. On occasion the remainder move over from the Skagit flats, and at such times the entire foreshores of Iona, Sea, Lulu, and Westham Islands are white with these splendid birds.

In British Columbia it arrives from the breeding-grounds in October and remains on the wintering-grounds until April and May. Other flocks wintering to the south pass over at the same time, and are often seen in flight through the interior, over Vancouver Island, and along the west coast. In fall migration, some of these birds sometimes drop in to feed at certain points in the interior and on the west coast of Vancouver Island, but, as far as is known, none spend the winter in those areas.

The snow goose is a "grubber," feeding largely upon plant roots and stems. In British Columbia it does little damage

crops, for here it usually frequents the sea and the tidal flats, where the chief food items are the roots of the aquatic plants which grow in profusion along the foreshores of the Fraser delta. In the south, however, it lives in the interior and often feeds on farm crops. At such times it is capable of doing much damage, often cleaning out whole fields of valuable clover, alfalfa, and other seed crops overnight.

The snow goose is a fine game bird, spectacular in appearance, fast, wary, and quite edible, although many claim the flesh inferior to that of other waterfowl. On occasion it decoys well to newspapers or white cloths scattered about on the ground, but most hunters use white plywood silhouettes, floating blocks, and goose calls.

The usual cry of the snow goose is a high-pitched honk, but when at rest on the sea or ground it often emits a whooping note, reminiscent of a dog barking.

In flight this bird is very noisy, and, to my mind, one of the most thrilling sounds in nature is the medley of calls which reaches down from the skies as a flock of "wavies" passes overhead. It often travels in flocks of several hundred, and at such times the symphony produced by their calls is beyond description.

The Ross goose is a much smaller bird (3 pounds) than is the lesser snow goose. It lacks a "grinning patch," but the upper mandible has a wrinkled warty appearance, which is distinctive. As in the snow goose, the adult plumage of the Ross goose is snowy white with black wing-tips, but some individuals have minute black markings on the feathers of the body.

The Ross goose winters in the San Joaquin and Sacramento Valleys of California and in Ventura and Orange Counties farther south, but until 1940 its breeding-ground was unknown. In the spring it moves northwards to the Athabasca-Mackenzie region, and disappears from there into the high north, reappearing again over the same routes in the fall.

Many unsuccessful attempts were made to discover the breeding-grounds before well-known sportsman-naturalist Ted White, now of Victoria, discussed the problem with R. H. G.

Bonnycastle, of the Hudson's Bay Company, setting in motion the wheels that led to the eventual discovery.

On July 1st, 1940, two officials of the Hudson's Bay Company finally located the breeding-ground on a lake near tributaries of the Perry River in the eastern Arctic.

In British Columbia this little goose has been recorded at Comox, Stuart Lake, Kuper Island, Rawlings Lake, and at 149 Mile in the Cariboo.

Mallard.

(Female.) (Male.)

DABBLING DUCKS

Mallard

This bird is so universally known that the word "duck" invariably brings mallard to mind; no description is necessary here.

However, there are some features in this bird's life-history that are not so well known. We'll deal first with the range. Most people think of mallards as nesting in the far north and wintering in the south, with a few scattered individuals nesting here and there. Actually the breeding range extends from the latitude of northern California all the way north to central Alaska. It nests on the ground, in low hollow stumps and in brush, quite often far from the water. The preferred nesting spots, however, are on the ground and close to water. The female usually lays from eight to ten eggs, which she covers with down plucked from her breast. She broods and raises the young without any help from the drake, which, at the time the young are hatched, is skulking away in the cover undergoing moult.

In the winter the mallard remains as far north as open water and available food permit, but, strangely enough, few mallards occur normally at any season in the high north, and in limited numbers east of Ontario in Canada. In the United States the winter range extends across to the Atlantic seaboard at about the 40th parallel and south throughout the remainder of that country and well into Mexico.

In the summer the male goes into what is known as eclipse plumage, at which time he closely resembles the female. He starts moulting for that plumage in late June and early July, wears it for a month or so, and then starts to take on the well-known green head and silver flanks; by October many drakes are once again in full plumage, but some retain mottled plumage throughout November and December. Many sportsmen believe such mottled birds are invariably young males of the year, and, as such, better eating than the full-plumaged birds. Actually the opposite is often true, for in recent checks it has been found that many late mottled birds are old birds, slow in regaining their full plumage. There is little doubt that one of the finest-eating game birds is the mallard. In the field, too, it ranks first with most sportsmen, being big, beautiful, decoys well, and yet is wary enough to keep the hunter guessing. Occasionally, in the late fall, the coastal mallard feeds upon dead salmon along the streams. At such times it is said to be most unpalatable.

The mallard is a versatile duck, adapting well to the ecological changes brought about by man's agricultural pursuits. It has turned the grain-fields to its own advantage, and feeds on a wide variety of other domestic crops. Apples, potatoes, peas, corn, and the like are all taken avidly. This adaptability, not only in feeding, but in nesting and in other respects, has a survival value which many other species of waterfowl do not possess. Thus while such birds as the gadwall, redhead, and blue-winged teal have fallen off in numbers and have not recovered, the mallard has flourished, and is to-day one of our most plentiful ducks.

Gadwall.

(Female.) (Male.)

GADWALL

The gadwall is probably the least known of all the ducks which occur in British Columbia. It is confused mainly with the female baldpate and mallard, and to a lesser extent with the female pintail. Both male and female are somewhat drab appearing when compared to other pond ducks, but the distinguishing features are quite apparent if one knows what to look for.

The gadwall is a large duck, about the size of the mallard. In full plumage the male appears dark grey with a white breast and black hind parts. The female appears more brownish and with the breast often mottled in brown. At close range the grey feathers on the breast and sides of the male show concentric white markings which are distinctive. The greater wing coverts are black and conspicuously edged in bright chestnut, a marking found on none of our other ducks. The rump on both male and female is black

and often shows a greenish tinge. In both sexes also, the secondary flight feathers are white, and in flight this shows as a patch at the trailing edge of the wing, which distinguishes this duck from the baldpate, in which the white patch is at the leading edge. The feet of the gadwall are yellow with black webs; the only other pond ducks with yellow feet are the cinnamon teal, blue-winged teal, and wood duck, all of which are too small to be confused with this bird. Despite these distinguishing features, the great majority of hunters in the Province confuse this duck with others, and every year a few specimens are sent to us for identification.

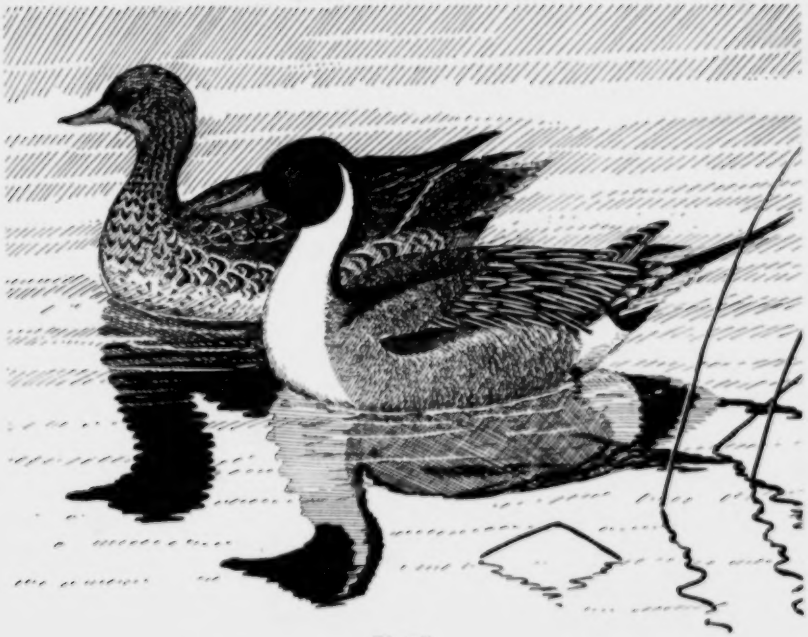
The gadwall has a wide distribution; it is found in most lands except South America and Australia. In North America it is a bird of the central and western region, nesting north to the 55th parallel, west to the interior of British Columbia, east to western Manitoba, and south to the 40th parallel.

This bird seldom builds its nest at the water's edge, although it usually selects an island for the site. It lays from seven to thirteen cream-coloured eggs in a well-concealed nest. The few nesting records for the Province indicate that the young hatch out in July, as downy young have been recorded in early August and half-grown young in mid-September.

The main wintering range extends in a crescent shape south from the central coast of Washington, through the southern States and Mexico, and north again to the 40th parallel. A few gadwall winter along the British Columbia coast north to the Queen Charlotte Islands. In the summer and fall it is more plentiful in the southern interior, where a few nesting records have been taken. Every winter small numbers are shot by duck-hunters on the lower mainland and on Vancouver Island.

The gadwall is one of the few pond ducks which can and does dive for its food. It feeds mainly upon aquatic plants, but, like some other ducks, has taken to the grain-fields and truck-gardens.

Many claim the meat of this bird to be second rate, while others say it compares favourably with the mallard. The gadwall does occasionally feed on aquatic animals, which perhaps accounts for differences noted in palatability. As a game bird, it is unimportant in British Columbia, due mainly to the small numbers which occur here.



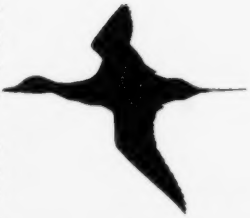
Pintail.

(Female.) (Male.)

PINTAIL

The full-plumaged drake pintail is a very handsome long-necked duck with a grey back, white breast, and a long pointed tail. The white of the breast carries on up the foreneck and splits at the chin, extending into the brown on each side of the head as two white lines.

The female resembles the female mallard, but she has a much longer neck, is slimmer, and has a more sharply pointed tail. In other details of plumage the pintails are distinctive, but the generalized description here given is sufficient for such a well-known bird. In flight this duck may be recognized at great distance, the long neck being the " give-away "; no other duck in British Columbia has a similar flight silhouette.



The pintail is the first duck to appear in migration, both spring and fall. It nests throughout Alaska, east across Canada to the Hudson Bay, and south to the 40th parallel in the United States.

There are many gaps in this range where no pintails nest, notably along the coast from Alaska south, and in many areas in central British Columbia; most of the population nests in the subarctic and on the Great Plains. At any rate this bird has the widest breeding range of any of our ducks. It is an early breeder, frequently laying its eggs in April, the first broods appearing after an incubation period of twenty-two or twenty-three days. The nest is built on dry ground, very often at a considerable distance from water. The eggs are pale olive-green in colour and number from six to twelve.

The pintail winters along the Pacific Coast, from the Queen Charlottes south through Mexico and the southern States along the Gulf of Mexico, and north on the Atlantic Coast as far as New York.

Along the British Columbia coast, flocks of pintail begin to appear from the south as early as December and January; they seem to " hang up " in suitable northern areas with those that have wintered there; as spring progresses, the population builds up until March and April, when a general exodus to the nesting-grounds takes place. The species is then absent from the coastal areas until late August, when the first migrants show on their way south; the migration builds up with large flocks passing southward in September and October, with relatively small numbers remaining to winter on the British Columbia coast.

With waterfowlers the pintail ranks second only to the mallard as a game bird. A fast flyer, large, handsome, and palatable, it is a welcome addition to any bag.

The species has withstood man's encroachment well, probably because most of the population nests in remote areas. Like the mallard, it has utilized man's agricultural pursuits, and where once it subsisted largely upon aquatic plants, and to a lesser extent animals, it now forages readily in the grain-fields as well.

The pintail has a circumpolar range; forms found in northern Europe and Asia differ only slightly from those on this continent.

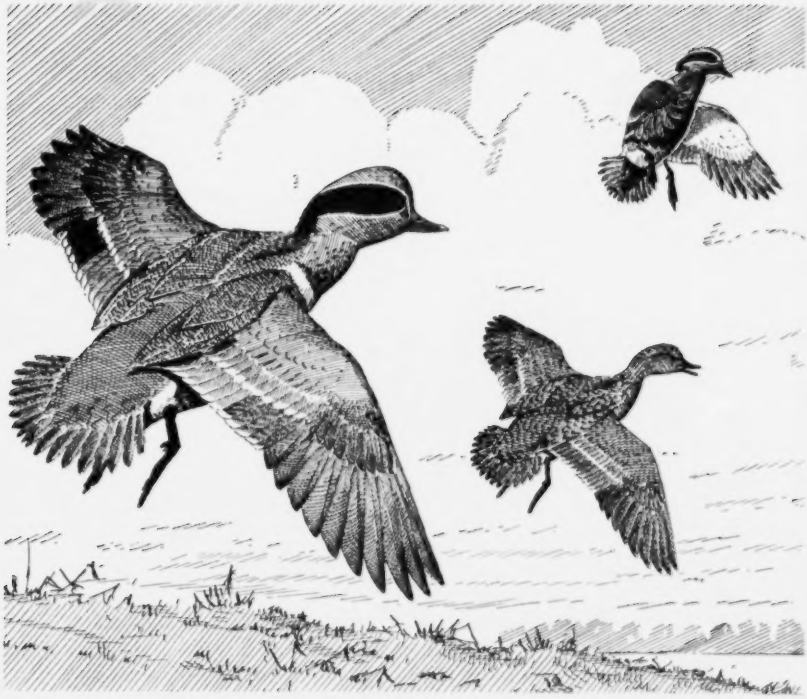
Green-winged Teal

The green-winged teal is the smallest of our waterfowl, and one of the most beautiful. The drake in full plumage has a red head with a green face patch which encircles the eye and extends to the back of the head. Its cream-coloured breast is delicately spotted in black; underparts are white, often stained to rusty. The shoulder, back, and sides are finely vermiculated in grey and white, grey predominating. A vertical black bar clearly demarks the under tail coverts, which are a soft cream colour below and on the sides. Immediately ahead of the wing there is a vertical white bar which serves to distinguish this bird from its European counterpart. In the European green-wing, which occurs here occasionally, this vertical bar is absent and a horizontal white bar is present over the folded wing. Another distinguishing feature—on the underwing, the axillars (long narrow feathers in the "arm pit") are white in the North American bird and barred in the European. The speculum (coloured wing patch) of this teal, both in Europe and America, is a bright metallic green bordered in black on the sides, in buff at the front, and in white at the back.

The female is mottled brown, with white underparts; small size and a green speculum are the chief distinguishing features.

The breeding range of the green-wing extends across the western part of the continent north of the 40th parallel. In British Columbia this bird nests throughout the interior but not on the coast. The coastal areas of the Province form part of the wintering-grounds for the species, and a few winter in the southern interior when open water permits. The bulk of the population, however, winters in the southern United States, Mexico, and Central America.

The green-wing is prolific, the female laying from eight to twelve and sometimes as many as eighteen eggs. Like the mallard, it is a versatile bird, and despite man's encroachment upon much of the breeding range, it has maintained its numbers through the years. It is among the most plentiful of our waterfowl.



Green-winged teal.

(Males above.) (Female.)

This teal is a fast flyer; moreover, the diminutive size, rapid wing beat, and erratic flight accentuates the speed so that many sportsmen have difficulty in bagging the singles. However, it often travels in large, easy-to-hit, close-knit flocks, and in many areas the green-wing forms a large part of the hunter's bag. This small duck is, as a rule, a fine table bird, fat and succulent as a result of its diet of aquatic plants. Occasionally it does feed upon the flesh of dead salmon, and at such times is said to be most unpalatable.

Sutton, quoted in Bent (1923), gives the following account of the courtship display of the green-winged teal: "A female, accompanied by two males, was resting in a pond when suddenly the two

males started to swim about the pond in poses which were ridiculously similar; the bills were pointing somewhat upward and the heads drawn back in a stiff and uncomfortable-looking manner. Strange as it may seem, so similar were the birds in their every movement, that even the feet seemed to stroke in perfect harmony and the picture was one of unusual beauty. Back and forth they swam, then, still in perfect harmony of movement, they started swimming in a circle around the female, keeping about two feet apart, and at a tantalizingly deliberate speed. The female all the while appeared utterly unobservant. The males suddenly started a remarkable series of bobbings, opening their bills widely and uttering a musical pheep, pheep; all the while they kept wheeling in a circle about six feet in diameter. The female suddenly made a rush at one of the males, whereupon he stood up in the water, lifted his wings slightly, and with rapidly churning feet made a most unusual noise, like a fine jet of water impinging on some object; as soon as this happened he settled to rest for a while and the other male arose and repeated the performance; occasionally both would perform the antic at the same time. The attitude of the males toward one another throughout the entire display was always one of dignified tolerance and, while they vied with one another in matters of elegance of movement, there was never any sign of combat."

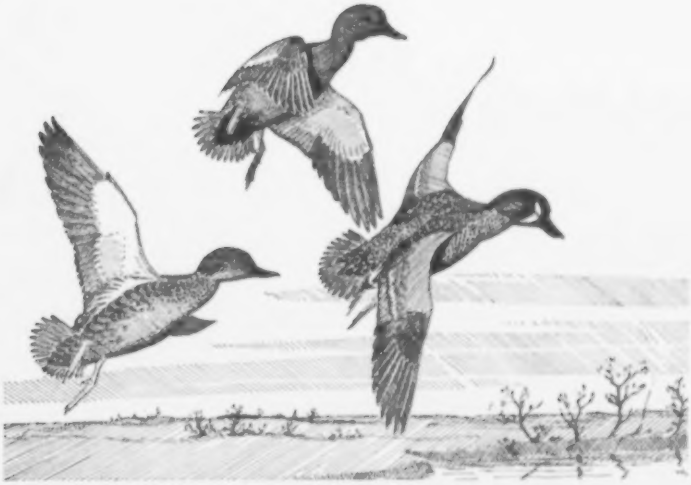
Cinnamon and Blue-winged Teal

The flighting ducks depicted over page are cinnamon and blue-winged teals. The drake cinnamon is shown above the leading bird, which is a drake blue-wing. The bird shown trailing behind could be of either species, for the females of these two teals are almost identical in appearance and most difficult to identify even when in the hand.

BLUE-WINGED TEAL

CINNAMON TEAL

The full-plumaged cinnamon drake is distinctive in appearance, with the head, neck, chest, and sides a rich cinnamon brown darkening to almost



Cinnamon and blue-winged teal.

(Female.) (Males.)

black under tail coverts. On the back the cinnamon colour of the neck darkens to a rich brown, with feathers edged in lighter shades; the tail feathers are dark brown above edged in buff and are grey underneath. On the upper side of the wing there is a large patch of light blue, and the speculum (coloured wing patch) is bright metallic green bordered before and behind in white, and in black on the sides. The bill is black; the feet are dull orange with black webs; and the eye is orange. The female is a small, mottled, brownish-coloured duck with a light-coloured breast. The upper surface of her wing is like that of the male but somewhat duller.

In British Columbia the cinnamon teal nests near the shores of marshy lakes in the southern interior and occasionally as far north as Williams Lake. The nest is built in a hollow in the ground; it is lined with fine grasses and other soft vegetation as well as down, and is most often very well concealed. Usually ten or twelve pure-white to buffy-coloured eggs make up the clutch.

Unlike many species of duck, the male, though not taking part in incubation, does not always desert the female, but aids in the raising of the young.

This bird occurs in southern coastal areas in May during the spring migration, but is uncommon in the fall, and so far only one winter record has been secured in the Province, an adult male taken at Ladner. The main breeding and winter ranges lie to the south in the western United States, where they overlap to a large extent, so that only a short migration is necessary for most of the birds. Southern British Columbia is, in actuality, the northern limit of this species' range.

The full-plumaged drake blue-winged teal is no less striking in appearance than is the cinnamon. In size and wing pattern the birds are almost identical, but there the resemblance ends. The head and neck of the blue-wing are slate grey with a purplish and greenish cast. The top of the head and chin are black, and there is a conspicuous crescent-shaped white patch, delicately edged with black, ahead of the eye; the eye is brown. The feathers of the back are brownish with U-shaped buffy markings, while the breast, belly, and sides are a pale cinnamon colour, strongly marked with round black spots. A very distinctive appearing bird, the drake blue-wing can be mistaken for nothing else. The female, however, so closely resembles the female cinnamon teal that the only sure field identification is presence of the male. Freshly killed females can sometimes be separated by examination of the bill, which is smaller and parallel-sided in the blue-wing, larger and more narrow at the base in the cinnamon.

The blue-winged teal nests around lakes in the interior of British Columbia from the southern border north to Atlin in the west, and in the Peace River country on the eastern side of the Province. Nests vary a good deal in structure, but are usually placed in good cover close to the water and with the lip of the nest flush with the ground. Like the nest of the cinnamon teal, it is lined with soft vegetation and down. Usually ten or twelve pale olive- to cream-coloured eggs are laid in the early spring.

On the southern coast-lines this bird occurs in small numbers during the spring and summer months, but it is essentially a bird

of the interior. Continentally, the main breeding range extends across the Great Plains, south to the 40th parallel, north to Great Slave Lake, and south-east on a diagonal to the Great Lakes. The winter range extends along the Gulf of Mexico, south through Mexico and Central America to South America.

The cinnamon and blue-winged teals are fast fliers and their flesh is very palatable as both feed largely on aquatic plants rather than animal matter.

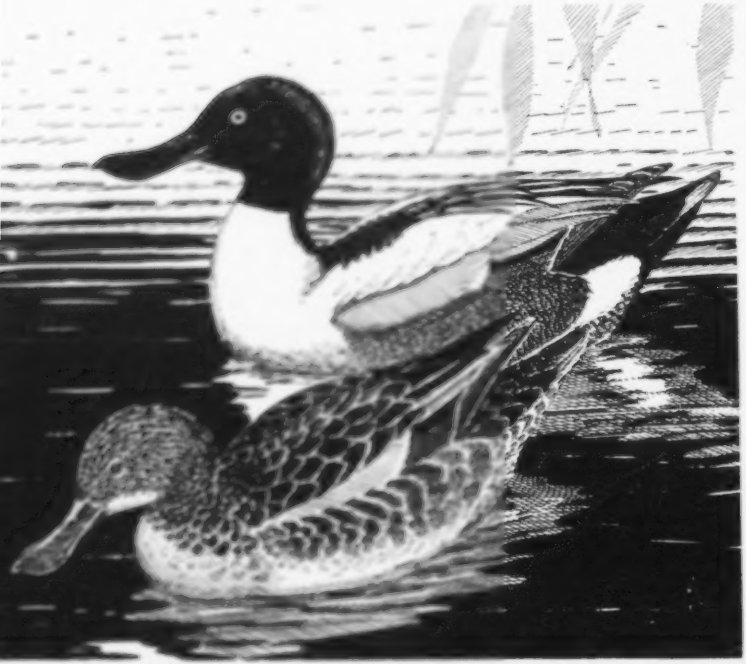
Shoveller

This bird is often called the " spoon-bill " because of its large, flat, shovel-like upper mandible. The adult male in full plumage is a gaudy bird with a bright green head, white breast, reddish abdomen and sides, and black hind parts. Except for the large bill the shoveller is much like the blue-winged and cinnamon teals in structure and habit and is regarded by most ornithologists as a teal.

The female also has a large shovel-like bill, but otherwise she is a drab light-brown colour except for the greater coverts on the wing, which are a shade of greyish-blue; the speculum (coloured wing patch) is green. In the male these wing features are essentially the same as in the female but are brighter in hue.

The shoveller has a wide distribution. It is found in North America, Europe, and Asia. On this continent the breeding range extends from Alaska south to the 40th parallel, east to the Great Lakes, and west to the Coast Range. The winter range extends from the south coast of British Columbia, south through the Pacific States and Mexico, and along the Gulf of Mexico on the Atlantic side.

This bird is largely a surface feeder. The broad bill is equipped with prominent bristle-like plates (lamillæ) which strain out the food material when the bird is feeding. Animal food comprises about one-third of its diet, the rest being made up of seeds of sedges, pond weeds, grasses, smart-weed, and similar plants.



Shoveller.

(Female.) (Male.)

In coastal British Columbia the shoveller is one of the most common ducks during the winter months. It is not rated highly as a game bird, especially in settled areas where it often congregates around sewer outlets to obtain its food. In many coastal areas the shoveller is often thin and scrawny, and although a fast flyer and a beautiful bird, most hunters don't seek it out.

The courtship of the shoveller as described by Kortright (1942) is performed both in the air and on the water: " Spirited aerial flights are undertaken in which one female is pursued by two or three drakes; they circle and twist in their erratic flight very much

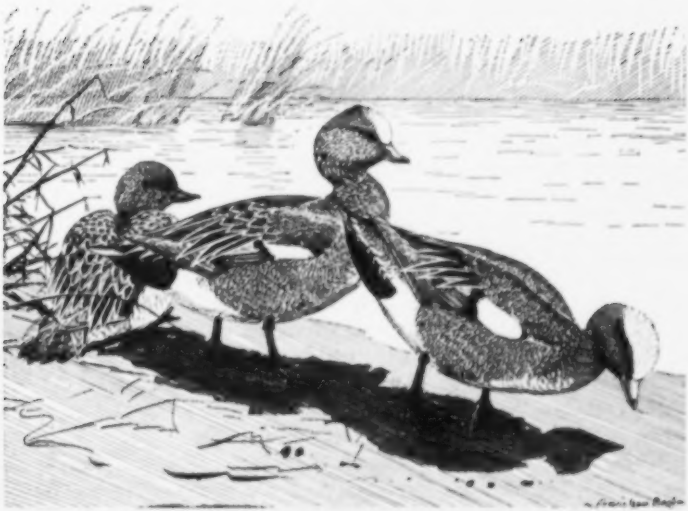
after the manner of the teals. On the water the performance is not very demonstrative; the male swims slowly up to the female by uttering his love notes of chu-uck chu-uck, varied but not improved, by an occasional konk, konk, at the same time elevating his head and jerking his bill upwards. The female responds quickly with bows of recognition and they both proceed to swim slowly around in circles, one behind the other, with water running through their bills.

"The female shoveller, and one would never think it of her, indulges in the luxury of two husbands. Polyandry is very prevalent with this species and the amiability with which this unusual matrimonial arrangement is accepted by both husbands is astounding or, depending on the point of view, commendable. . . . It is interesting to note that it is not until after two adult shovellers have paired that the second husband comes along. He is usually a young drake of the previous year with incomplete plumage, who has probably found that the young females of his own generation have gone off by themselves and do not intend to pair until next season, as is generally the case with this species."

This bird nests on the ground, laying from six to fourteen pale buffy to greenish-coloured eggs. Incubation is from twenty-one to twenty-three days. The young when first hatched have conventionally shaped bills which enlarge rapidly as the ducklings grow. Incubation and care of the young are carried out by the female; the males congregating on near-by sloughs.

Baldpate and European Widgeon

The drake baldpate or American widgeon is a medium-sized duck with a snow-white breast and abdomen, pinkish-brown sides, and black hind parts. The general head colour is creamy grey speckled with black, but the forehead and top are white—the characteristic which gives the bird its name. The eye is encircled by a large metallic green patch which extends to the back of the head, and the bill is light blue above with a black tip. The extended wing shows a large white patch on the leading edge, and the speculum (coloured wing patch) is glossy green with a black margin



Baldpate and European widgeon (right).
(Female.) (Males.)

behind. The female is a drab creature compared to the male. She is greyish-brown in colour with a snow-white breast and abdomen. She lacks the clear-cut coloration and adornments which characterize the male on head and hind parts.

The female baldpate is sometimes confused with the female gadwall. However, the baldpate has greyish-blue feet, while those of the gadwall are yellow with dark webs. The baldpate, too, is a smaller duck, and the female shows much less white on the wing than does the female gadwall.

The baldpate breeds through north and central Alaska, south in suitable habitat to the 40th parallel, and east to the Great Lakes. This bird nests on the ground sometimes far from water and with little attempt at concealment. It lays from six to twelve creamy-white eggs which hatch out after an incubation period of twenty-four or twenty-five days. Incubation and care of young fall solely to the female.

It does not breed along the coast of British Columbia, but it is plentiful in the Cariboo parklands, and some nest in the southern interior. The wintering-ground extends from coastal British Columbia, where the species is very plentiful, south through the Pacific States, throughout Mexico, and along the Atlantic coast north to the State of Maine.

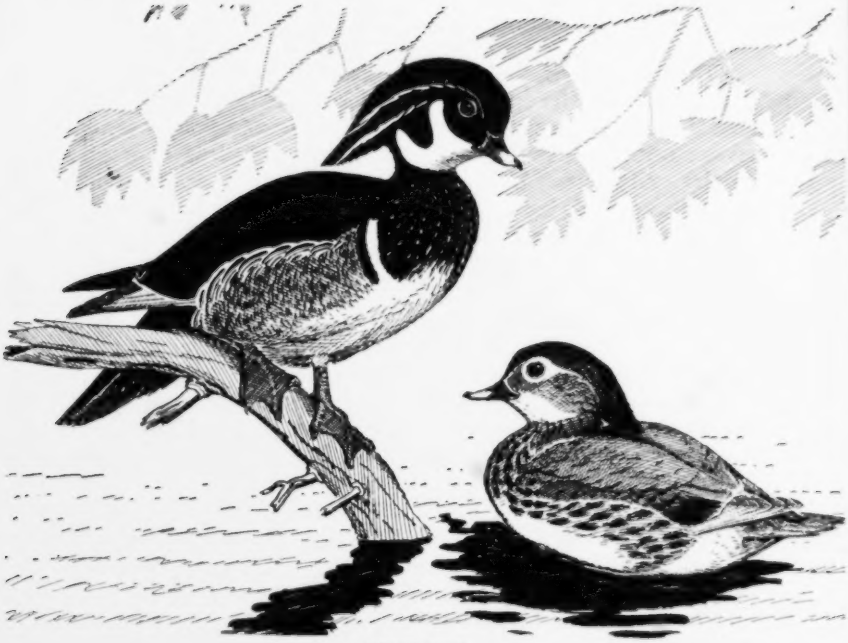
The baldpate is primarily a vegetable feeder, about 93 per cent of the diet being made up of pond weeds, grasses, sedges, and similar plants. On the coast it eats marine algæ and eel grass, and occasionally molluscs. Very often, when on this marine food, the flesh of this species is unpalatable, with a distinct "low tide" odour permeating the house as it is roasting. However, birds feeding in fields or on lawn grass and pond weeds are delicious.

The baldpate is a fast flyer and is usually cautious. On some occasions it decoys well, but on others it ignores the set. Nevertheless, it is a favourite bird amongst waterfowlers, and in many areas it forms a large part of the annual harvest.

The birds pictured at the extreme left are female and male baldpate. The bird on the right is a European widgeon, which closely resembles the North American bird, but has the grey of the head replaced by a rich brick red. It occurs regularly in small numbers along the British Columbia coast during the winter months, but is considered to be a straggler from the Old World.

Wood Duck

Perhaps none of the other waterfowl has such popular appeal as does the wood duck, for the full-plumaged male is a bird of great beauty. The scientific name *Aix sponsa* has its origin in Greek and Latin. *Aix* means a kind of waterfowl (Greek), and *sponsa*, from the Latin, means betrothed; that is, as if in wedding dress. The name is most appropriate, for the male, resplendent with iridescent metallic green crown and bronze crest and with iridescent purple, violet, green, and bronze markings on his face, is, indeed, as dressed up as any aboriginal bridegroom ever was. The chin and throat are white, and from the throat two broad white markings extend upwards—one to the eye, the other lower down on the head. Additional white lines, much finer, run above these markings—one



Wood duck.

(Male.) (Female.)

extending from the bill over the eye and into the crest, the other paralleling it, but beginning just behind the eye. The bill is marked in black, pink, and red, and the eye and eyelid vary in colour from orange-red to vermilion.

The back and rump of this bird are bronzy-green in colour; the upper sides are black with a purplish-green bloom. The side coverts are a yellowish-buff colour, finely vermiculated in black, and the breast is a rich chestnut colour speckled with delicate buffy spots. The tail is black above, with a metallic green, bronze, and purplish bloom; below it is shiny brown in colour. The wings, too, are colourfully marked in metallic blues, greens, silver-grey, black, and white. There is little doubt that this duck is the most beautifully marked of all the North American waterfowl.

The female is relatively drab by comparison, but she, too, is a thing of beauty. Her crest is much reduced, and in general appearance she is a delicate grey in colour. Closer examination, however, reveals soft brown shades and faint metallic suffusions of greens, purples, and bronze. Her eye is surrounded by a prominent white ring which extends back a short distance, a characteristic marking which stands out clearly at a distance. Compared to the females of other ducks, drab though she is in comparison to her mate, the female wood duck displays more colour than most, and in herself is one of nature's masterpieces.

In North America the wood duck occupies a peculiar range, split almost by the width of half the continent. In the east it extends from the Maritimes in Canada, south along the entire Atlantic seaboard of the United States and westward across the northern side of the Great Lakes to Lake Superior, west from there only a short distance, and south to the Gulf of Mexico. In Western Canada the range is much smaller, including only southern British Columbia west of the Rockies and south as a narrow band through the coastal states to central California. In the west, wood ducks nest throughout the range except in the extreme south-western part.

The introduced Mandarin duck may be confused with the native wood duck. The birds are very similar in appearance; the females are practically identical, but the Mandarin male carries prominent golden-coloured feathers on the head and wing, which are absent in the wood duck.

The wood duck nests in hollow trees, the old nests of pileated woodpeckers being favoured. It may be induced to nest in certain areas by affixing nesting-boxes in suitable habitat; nail-kegs make good nesting-boxes. When the young hatch and are ready to leave the nest, they simply tumble out and fall to the ground or water, as the case may be. Apparently unhurt by the fall, they toddle off after their mother as frisky as any young ground-hatched duck.

The wood duck feeds 90 per cent on vegetable matter, the remaining 10 per cent being made up of insects and spiders.

Redhead.

(Male.) (Female.)

DIVING DUCKS

REDHEAD

In full plumage the drake headhead has a reddish-coloured head, a black chest, light-grey back, and a white belly, a plumage which closely parallels that of the canvas-back. The finely vermiculated grey of the back is darker however, and the head is round with a well-defined forehead. The bill is pale blue with a black

tip, the blue and the black being separated by a narrow white band. In the canvas-back the bill is completely dark, longer than the redhead's, and it slopes back gradually, merging with the head to give an impression of a receding forehead. The whole of the neck and head of the canvas-back is red, while that of the redhead is red on the upper half of the neck only, the lower part being black like the breast.

The plumage of the female is somewhat similar in both redhead and canvas-back; the head is yellowish-brown, the chest brownish, and the remainder of the upper body and sides greyish-brown. The belly is white. On the whole, the female redhead is a browner-coloured bird than is her canvas-back counterpart. The differences in head shape and bill characteristics of the males prevail in the females and are the main features used in separating these birds.

The redhead nests around marshy edges, usually close to deep water. The female lays from six to fifteen pale buffy-coloured eggs in a beautifully constructed nest made of rushes and reeds and lined with white down. More down is added to form a complete covering for the eggs as incubation advances. Only the female takes part in incubation.

. The main breeding range of this species extends from central Alberta, Saskatchewan, and Manitoba south to the 40th parallel in the central United States. However, there is a small breeding population in British Columbia, with a range extending from the Vanderhoof area in the Cariboo parklands south through the Okanagan in the dry forest biotic area. At one time, redheads were numerous during the winter months on the larger lakes of the Okanagan Valley, but the numbers are now greatly reduced. The redhead's breeding range is entirely within the confines of civilization, and the use of much of this habitat for agricultural purposes is said to account for the comparatively small populations of the present day.

The redhead migrates south in October to spend the winter in the southern United States and Mexico. It is recorded in small numbers on the British Columbia coast during the spring and winter months.

Unlike many of the diving ducks, this species feeds largely on vegetable matter. Of nearly 400 stomachs taken throughout the year from widely separated areas in the United States and Canada, 70 per cent contained only vegetable food and less than 1 per cent contained animal matter alone. On the average about 90 per cent of this diver's food is vegetable.

CANVAS-BACK

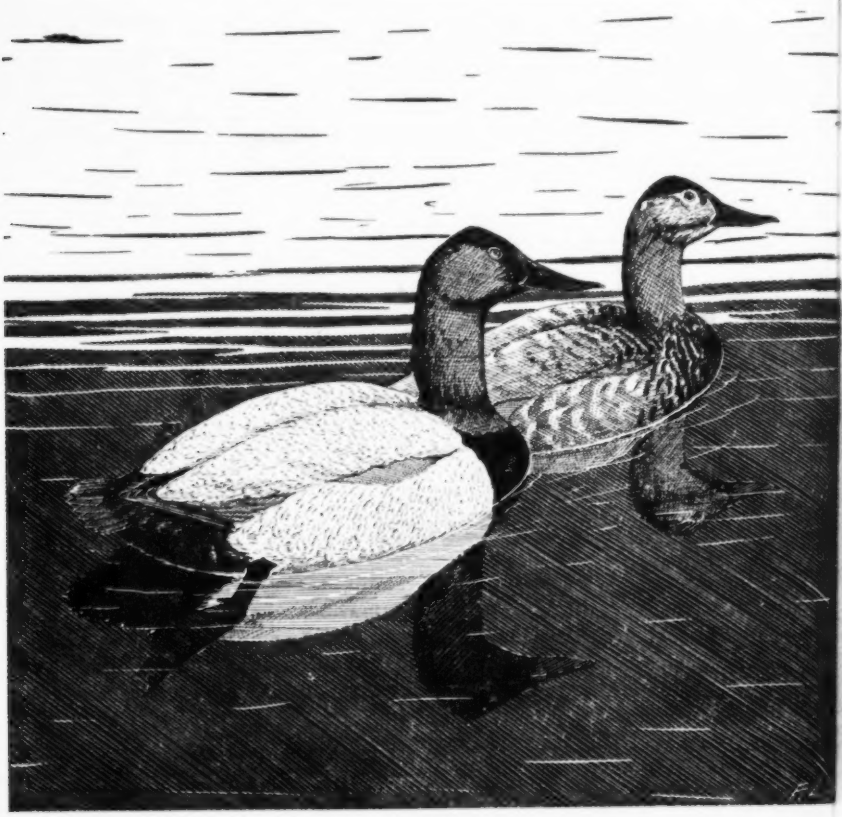
The canvas-back, one of the large diving ducks, can be confused only with the redhead. The adult male is strikingly marked with a dark-red head and neck. The back is very light grey, finely vermiculated with black, but it appears white at a distance. The breast and shoulders are black, as are the tail and tail coverts; the back and sides are almost white, finely lined in black, and these, too, look white at a distance. Thus the drake, when seen on the water, appears to be a large white-bodied bird with a dark head, neck, and tail. The head, with its low sloping frontal region merging imperceptibly with the long black bill, is a good field characteristic and is equally useful in identifying both male and female canvas-backs. The female has a yellowish-brown head and shoulders, the face being paler on the sides and below. The breast and shoulders are darker brown, while the back and sides are brownish-grey.

In British Columbia the canvas-back occurs abundantly in the Cariboo parklands during the summer months. During the winter it is not uncommon along the southern coastal regions and in the Okanagan, too, when mild winters prevail. In this Province it nests mainly in the Cariboo, but some birds do nest occasionally in the southern interior. There are no nesting records for the coastal regions.

CANVAS-BACK

REDHEAD

Continentally, the main nesting area for this species is situated in central and western North America from Lake Winnipeg west to our Cariboo parklands and north to central Alaska. The breeding range extends south to about the



Canvas-back.

(Male.) (Female.)

40th parallel of latitude. In the fall the populations migrate to winter along narrow coastal strips down the Atlantic and Pacific seaboards. In the west this extends from Vancouver Island south through Mexico, and on the Atlantic from Maine south to and including the shores of the Gulf of Mexico.

The canvas-back is highly rated as a table bird, for it feeds mainly upon vegetable matter. Stomach analyses indicate that about four-fifths of the food is made up of pond weeds. It is large,

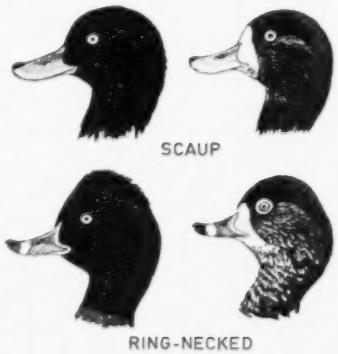
showy, and a fast flyer, which, coupled with high palatability, makes it a waterfowler's favourite. The canvas-back is a North American bird exclusively; it is not found anywhere else in the world. Despite decimation during the great drouth of 1934 and the loss of much of its breeding range to man, this bird still furnishes a great deal of sport annually for the hunters fortunate enough to live where it migrates and winters.

The canvas-back builds a cleverly concealed nest at the edge of fresh-water sloughs, utilizing bulrushes and reeds both for construction and concealment. From seven to nine eggs are laid in May, and, as with other ducks, these are covered with down plucked from the breast and abdomen of the female. The eggs are easily identified, being a darker olive shade than are the eggs of other ducks.

The male takes no part in nesting or raising of young, but deserts the female when the eggs are laid. The males gather with others of their kind in large flocks and proceed to moult into eclipse plumage resembling that of the female. In the fall they gradually resume their nuptial plumage.

Ring-necked Duck

The ring-necked is a small diving duck about the size of a lesser scaup (lesser blue-bill), and it superficially resembles that bird. In the adult male the head and neck are black, with a purplish or greenish iridescence when seen in proper light. The chest and back are also black; the belly is white on the forward part, dulling out to brownish-black on the abdomen. The sides are finely vermiculated in grey and white plumage blending into the white underparts below and clearly delineated from the black above, forming a distinctive crescent-shaped outline at the shoulder. The black



Ring-necked duck.

(Male.) (Female.)

of the neck is separated from that of the breast by a narrow chestnut-coloured band for which the bird is named. The wings carry a distinctive grey speculum. In silhouette these birds are readily distinguished from the scaups by the shape of the head, round in the latter but pointed in the ring-necked due to long elevated feathers on the crown which give the bird a crested appearance. The bill is distinctive also, having a black tip and two whitish bands —one at the base and one separating the blue of the mid-section from the black tip. For this reason this bird is often called the ring-billed duck.

The female is drab in colour; the head is greyish-brown, sometimes with a white throat. The back is brown, darkening toward the tail, and the flanks are also brown but with the feathers edged in white. Underparts are mottled white deepening to dusky brown on the belly. The bill characteristics and the grey speculum of the wing are similar to those of the male and readily distinguish this bird from female scaups.

The ring-necked duck builds a low nest of rushes, grasses, and such materials at the margin of boggy sloughs and ponds, usually just above the water-level. Eight to twelve olive- to buffy-coloured eggs are laid in June, and by early July the downy young are about with their mother. The male takes no part in the incubation or raising of young.

The main nesting area of the species extends on a diagonal from the 60th parallel south-east to the Great Lakes, encompassing a relatively narrow strip in the central part of the continent. There is a breeding area in the Maritimes and in British Columbia as well, the latter extending from the Cariboo parklands north-west to the Bulkley Valley.

During the winter months this beautiful little duck is not uncommon in the Gulf Islands, the Puget Sound area, on Vancouver Island, and casually on the Queen Charlottes. It is not plentiful, however, and seems to confine itself to certain favoured localities, showing a marked preference for fresh-water ponds and lakes. Specimens are often taken in the Campbell River and Sayward areas during the winter, and almost every small lake at the south end of Vancouver Island harbours a few wintering birds. The main wintering areas are situated in the south-eastern United States and in western Oregon and California.

Though a diver, the ring-necked duck subsists about 80 per cent on vegetable matter, and its flesh is most palatable. Many hunters, however, pass this bird up, mistaking it for the unpalatable blue-bill.

The Scaups

Pictured over page are two pairs of scaups or blue-bills, and although they resemble each other very closely, they represent two species of diving ducks. In the lead are the male birds; both have bright-blue bills, black heads and breasts. The back and scapulars are white vermiculated with black; the rump and tail are brownish-black. The birds are white on the lower part of the breast, darkening to sooty brown on the belly. The lesser scaup male (lead bird in background) is slightly smaller than the greater scaup, and has a purplish iridescence to the black feathers of an angular head. The wings show white on the flight feathers only up to the pri-

(Males.) Scaups. (Females.)

maries, although in some individuals two or three of the proximal primaries are pale. The greater scaup (lead, foreground) shows white on the flight feathers almost the entire length of the wing; the head is round and has a greenish iridescence to the plumage. The greater scaup is an appreciably larger bird. The best criterion for separating these two birds in the field is the extent of the white on the wings, the only distinguishing feature that may be seen at any distance.

Flying behind the males in the illustration are two females, almost identical in plumage. The distinguishing features here are

in the amount of white about the bill and in the amount of white on the wing. As with the male, the female greater scaup (above) shows white on the secondaries and primaries; she is larger and has a greater amount of white at the base of the bill; otherwise, she is almost identical to the lesser scaup female (below). Both birds are largely brown in colour. They have dark wings with the above-mentioned white markings, and the belly is white. The head, neck, and breast are brown; the bill and feet are blue. The white band is present at the base of the bill in both species.

In British Columbia there is only one nesting record for the greater scaup, this from the extreme north-western corner of the Province. The main breeding-ground lies in Alaska, the Yukon, and eastwards about half-way across the Northwest Territories. It extends south only a short distance along the British Columbia-Yukon and Alberta boundaries. The greater scaup constructs a nest on the ground close to water. It is lined with grasses and down, and due to the "dumping" habit may contain a couple of dozen eggs, the work of more than one female. The normal clutch consists of seven to ten buffy, olive-coloured eggs which hatch in July. In the late fall the greater scaup migrates to the Pacific Coast, where it winters from Alaska south to California, often passing through the interior of British Columbia en route. The greater scaup is a common bird along the British Columbia coast from October through March, where it frequents the salt water to a large extent.

The lesser scaup occurs mainly in the interior of the Province, where it nests during the summer months, particularly in the Cariboo and northwards. It builds a nest similar to that of the greater scaup, in which it lays from six to fifteen olive-coloured eggs. The eggs are darker than those of the greater scaup, but are almost identical to those of the ring-necked duck. Downy young are about with their parents in early July, but eggs have been recorded in the nest as late as August 10th. In the fall this bird migrates south to winter in the southern United States, Mexico, and Central America. The winter range extends northwards along the Pacific seaboard to southern British Columbia, where the species is seen

occasionally on fresh-water lakes and ponds. Sometimes it is seen with greater scaups on the salt water, but in fewer numbers.

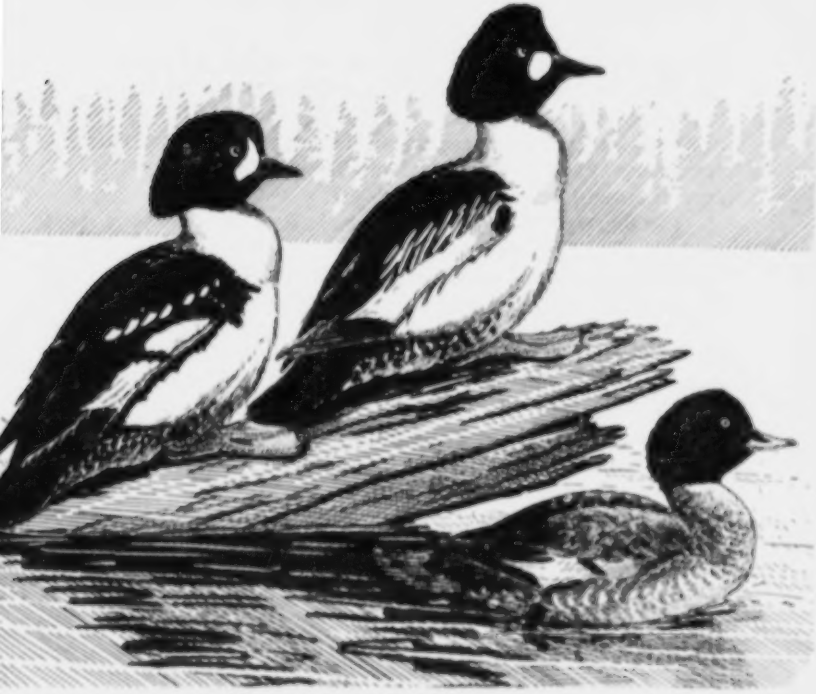
The diet of the greater scaup consists of about half and half vegetable and animal matter, but many birds, particularly on the coast, subsist almost entirely upon shell-fish, crustaceans, insects, and other animal foods. The flesh of these birds is usually unpalatable, with the result that the blue-bill is seldom hunted on the coast. Birds taken in the interior are said to be more palatable.

The lesser scaup feeds 60 per cent on vegetable food, and in most areas apart from the coast is considered a good table bird.

The main summer range of the lesser scaup extends from the Arctic shores, south to the 40th parallel of latitude, through the western side of the continent east of the Coast Range.

American and Barrow Golden-eye Ducks

Adult males of the two species of golden-eye are easily recognized when in full plumage. Both have black heads marked with prominent white patches on each side of the bill. In the American golden-eye (sometimes called common golden-eye) this patch is circular and the black of the head has a greenish iridescent wash. In the Barrow golden-eye the white mark on the face is crescent-shaped and the black of the head has a purplish iridescence. Both have bright golden eyes—hence the name—but the head shape differs, being longer than high in the American and vice versa in the Barrow. Both have completely white necks, breasts, and underparts. The side coverts are white, heavily edged in black in the Barrow golden-eye, finely edged in black in the American. The scapulars are white and black, with white predominant in the American. The back and tail are black, and in the Barrow the black extends downwards from the anterior end of the folded wing



Barrow and American golden-eyes.
(Male.) (Male.) (Female.)

to form a distinctive spur between the white plumage of the breast and side coverts. This black mark can be seen at a distance and is used in field identification.

The wings of both birds are dark with a white patch. In the American golden-eye this white is continuous through the secondary coverts and six secondaries. In the Barrow the white patch on the wing is interrupted by a black bar which may sometimes be used in field identification on flying birds.

The females differ mainly in the shape of the bill and in minute plumage differences. In both sexes the bill of the American golden-eye is broad to the tip and with a small nail; that of the

Barrow tapers more gradually to the tip and has a large nail. In the adult female plumage of both species the head is brown, the neck is white, the upper breast, back, and sides are generally greyish with lighter grey edgings to the feathers. On the underside the female of both species is white. The feet in both sexes of both species are yellow with dark webs.

The illustration shows an adult male Barrow golden-eye roosting behind an American; the female in the water could be of either species, for the dark wing bar is present in the female plumage of the American golden-eye as well as in the Barrow.

The American golden-eye nests from Alaska north and eastwards across the continent to the Maritimes, Labrador, and Newfoundland. The main breeding range cuts across north-western British Columbia in the Peace River parklands, but there are occasional records from the Cariboo and the Okanagan. In October and November this bird migrates to the coast and southwards to winter, and is then observed all along the British Columbia coast from Alaska southwards. It winters also along both seaboards of the United States and in the interior where open water permits. It returns northward in March and April to nest.

The Barrow golden-eye occurs on widely separated ranges in western North America and in Greenland and Iceland. In the west the breeding range extends from the interior of southern Alaska south to the central United States and California.

In British Columbia it nests mainly in the Cariboo parklands, the Vanderhoof region, and in the southern interior. It winters on the coast and sometimes in the interior south to central California. In this Province it is uncommon during the winter months, as compared to the American golden-eye. Over most of its range this bird migrates to the coast and southwards in October and November, moving back to the breeding-grounds in March and April. In coastal British Columbia, however, the migration of both species often begins earlier, usually in February.

Both golden-eyes are tree nesters as a rule, laying their eggs in natural cavities or in the abandoned holes of woodpeckers. The eggs of both species are almost identical but quite different from those of other ducks, being greenish in colour. Both species lay

from five to nineteen eggs, usually during May, downy young appearing with the parent in June.

Food of both species is made up largely of animal matter such as insects, crustaceans, and molluscs. On the coast, therefore, they are often unpalatable and not classed highly as game birds.

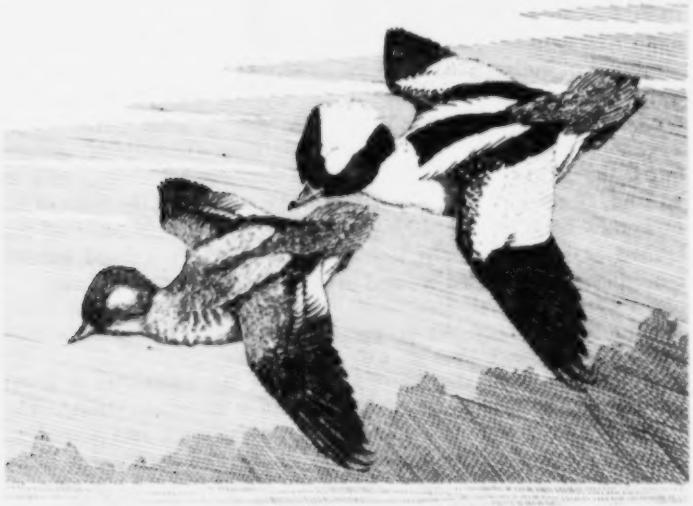
Separated by the width of the continent from these western birds, the Atlantic populations of the Barrow golden-eye nest in Iceland, Greenland, and Labrador, and winter from the Gulf of St. Lawrence south to the 40th parallel along the east coast of the United States. Kortright states that on treeless Iceland nesting takes place in rock cavities and in peat shelters built for sheep.

Buffle-head

The buffle-head, one of the smallest of our waterfowl, is about the size of the green-winged teal, but of a chunkier build. The male in full plumage is shining black on the back and scapulars; the neck, breast, and underparts are white; and the head is black with a broad white saddle extending across the top and down each side to well below the eye. The black of the head is iridescent, showing purple, red, and green reflections under favourable light conditions. This bird, especially the male, has a well-feathered puffy-appearing head—hence the name buffle-head. In some areas the term " butter-ball " is in common usage, due perhaps to the chunky round build.

The female is drab compared to her mate. The head and back are dull black, the sides are dark brownish-grey, and the underparts are greyish-white. Chief identifying features are small size and a prominent round white mark on each side of the head behind the eye. Both male and female have dark wings with white markings, the white being far more extensive on the male.

The buffle-head nests habitually in holes in trees, but in some areas where trees are scarce it nests in burrows in the ground, much as the kingfisher and some of the small sea-birds do. Usually the abandoned nesting-holes of woodpeckers and natural tree cavities are utilized, sometimes as high as 40 feet or more above the surface of the ground or water. From six to fourteen pale yellowish-olive coloured eggs are laid in May and June. Downy young are



Buffle-head.

(Female.) (Male.)

foraging with their parent by late June and early July. They tumble from the nest much as young wood ducks do and follow their mother, apparently none the worse for the experience.

In the west the breeding-ground of the buffle-head extends along the east side of the Coast Range from the wooded areas of Alaska through the interior of British Columbia south to California. In the interior of the continent it extends eastwards to Lake Ontario and south into the northern United States, but the large part of the population breeds in the wooded areas north and west of the Canadian prairies. The buffle-head winters along the Pacific shore-lines of British Columbia and the United States south to Mexico. It winters also across the southern States east to the Atlantic seaboard.

In April and May this duck migrates to the breeding-grounds, returning in the fall during late September and October.

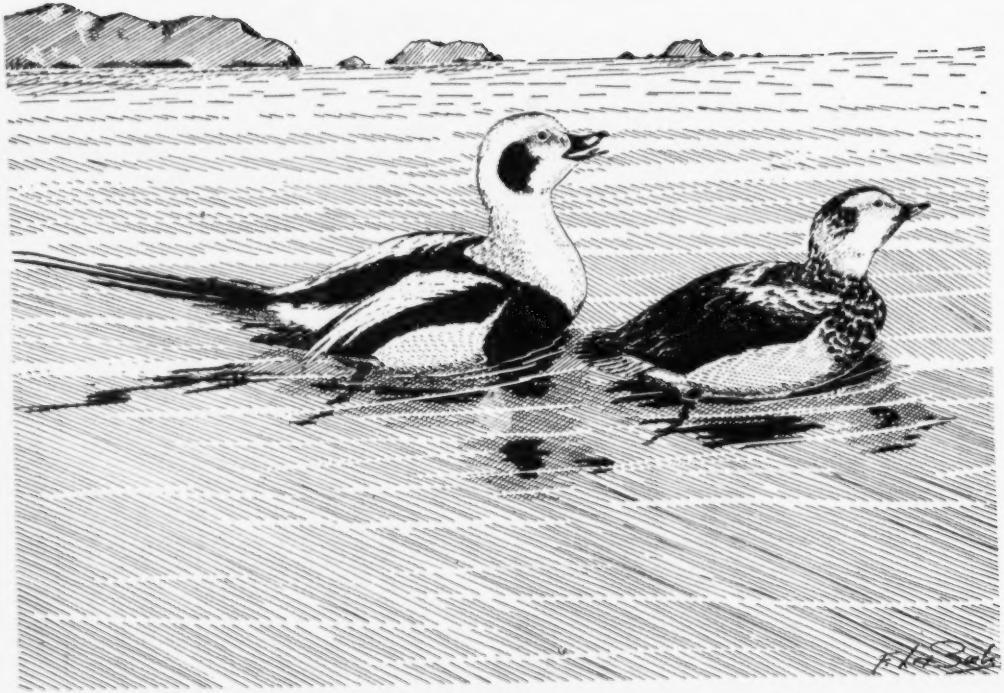
The buffle-head feeds primarily upon animal matter; insects, molluscs, crustaceans, and small fishes make up about 80 per cent of the diet. On the coastal wintering-grounds it feeds largely upon small mussels and crustaceans, and sometimes upon the remains of spawning salmon along the coastal streams. For these reasons it is not regarded highly as a table bird, and on this coast, at least, the buffle-head is seldom taken by waterfowlers.

Old Squaw Duck

The beautiful drake old squaw, pictured in winter plumage over page, is often called the sea pheasant, due, no doubt, to the long pointed central tail feathers. The head, neck, and shoulders of this medium-sized diving duck are largely white in winter. The side of the head, however, is marked from the base of the bill to well behind the eye with a pale buffy mark, which darkens abruptly to a rich dark-brown spot on the lower part of the face and upper neck. The back is black, with very light pale-grey feathers lying back from the shoulders; the breast is black and the underparts are solid white. The wings are dark brown, with lighter-brown secondaries. In winter plumage the female is light brown above with a bit of grey on the scapulars; her head is white on the sides, darker on top, and with a dark marking below and behind the eye. She is largely white on the underparts, and she does not have the long tail feathers which characterize the male. It is while in these plumages, mainly, that the old squaw is seen in British Columbia.

In the spring and summer months the male's head, neck, shoulders, and breast are solid jet black, except for a buffy patch at the base of the bill and an irregular white mark around the eye. The plumage of the back and scapulars is largely brown, each feather with a central dark streak; the lower breast and abdomen are white. The long black central tail feathers that characterize the male are present in this summer plumage as well. In the spring the female also changes, darkening on the back and upper breast, with the dark areas on the head predominating over the white seen in winter plumage.

Usually these birds have completed the moult from summer to winter plumage by September, and, as they arrive on the coastal



(Male.) Old squaw duck. (Female.)

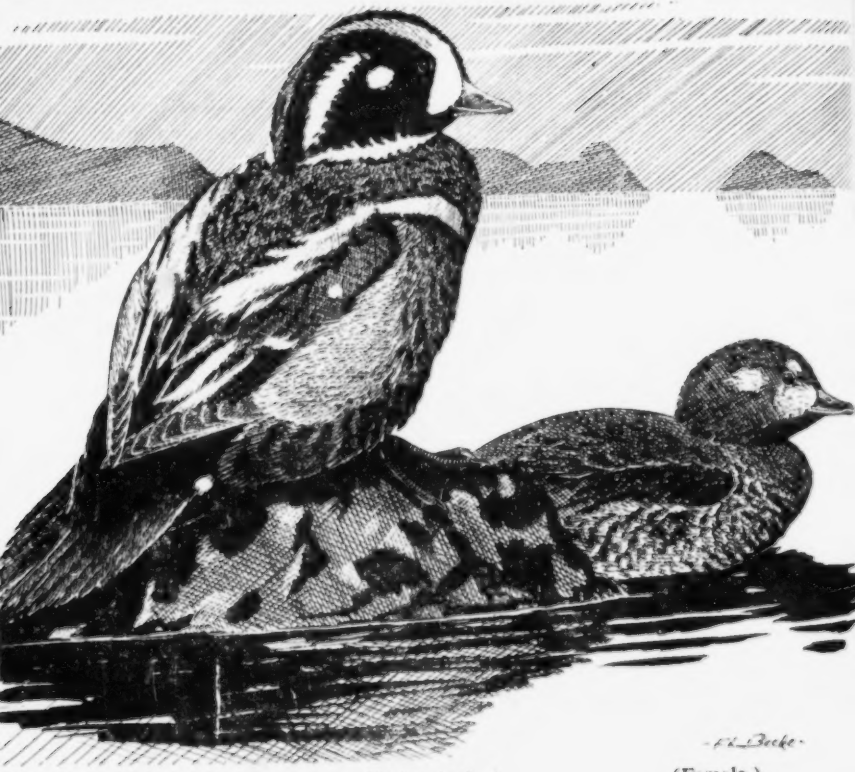
wintering-grounds in October, we see little of the dark nuptial or spring plumage. Sometimes, however, a few remain on the wintering-grounds until late April and May, and by that time most of them are showing the dark plumage described above.

The old squaw nests in the subarctic tundras from the Aleutian Islands eastwards to Iceland and south along the Labrador coast to Newfoundland. The nest is usually situated in a shallow depression, often at a considerable distance from water. The eggs are olive-buff in colour and number from five to seventeen. The female incubates the eggs and raises the young alone, although the male is said to be in attendance until incubation is almost completed. Males congregate on the sea-coast. In the west the old squaw winters along the Pacific Coast from Alaska to northern Washington, in the east from the Gulf of St. Lawrence along the Atlantic seaboard south to the 35th parallel, and in the vicinity of the Great Lakes as well.

This diver feeds primarily on animal matter, such as crustaceans and molluscs, which forms about 90 per cent of the diet. It is seldom hunted by British Columbia sportsmen.

Harlequin Duck

The harlequin drake is a medium-sized diving duck beautifully marked when in full plumage. The head, neck, breast, and underparts are blue, with the head darker than the other parts. The head carries three distinctive markings—a broad inverted comma-shaped white mark extending from below and in front of the eye, running back along the upper side of the head and changing there to a rich rusty colour, a small round white spot bordered in black behind the eye, and a lanceolate mark similarly coloured extending down the neck. A white collar edged on the lower side in black encircles the base of the neck, while other white black-edged marks form epaulets. The scapulars are edged in white; there is a white spot on the under tail coverts; and the flanks are a rich chestnut brown. All in all, it is a distinctively marked bird which can be mistaken for no other species. The female is dull greyish-brown above, whitish below. Three white marks on the face and a faint bluish tinge on the back break the drabness of her plumage. It



(Male.) Harlequin duck. (Female.)

seems as though nature " shot the works " on the drake and had little left to bestow upon his mate.

The harlequin spends the winter on the Pacific Coast of North America from San Francisco Bay northwards to the Aleutian Islands. It breeds along the rivers and streams of the Coast Range and in the interior east of the Rocky Mountains from the Mackenzie River south to Oregon and west into Montana.

The birds move to the breeding-grounds in April and early May and are absent from the marine habitat until mid-June, when the males return to the sea. The female stays on the interior stream

to incubate the eggs and raise the young, bringing them down to the sea usually in September and October. After returning from the nesting area, the drake moults into drab plumage resembling that of the female, and is seen in late July and early August in a flightless condition. At this time it frequents the kelp-beds around rocky shore-lines, diving and flopping much as young ducks do to escape the pursuer.

The nest of the western harlequin duck is difficult to locate, and few have been found. Those discovered have been situated close to the stream and usually at the base of a stump, a bush, or in a recess in trees or cliffs. From five to ten buffy-coloured eggs are laid in late May and early June, young appearing on the stream with the parent in late June and early July.

The food of the harlequin is made up almost exclusively of animal matter, about 98 per cent being composed of crustaceans, molluscs, and insects. On the Pacific Coast these ducks are seldom molested by hunters, although they are very numerous where rocky shores prevail. No doubt the flesh is unpalatable, and some say it is exceedingly tough as well.

Along the Atlantic seaboard the eastern harlequin occurs in much smaller numbers than does the western subspecies here. The birds are almost identical in appearance, differing slightly in size and in plumage pattern about the head.

King Eider

The king eider is a very large heavy-bodied duck, the male with an abrupt high forehead, along the sides of which lie peculiar yellow bill-processes edged in black feathers. In full plumage the male has a pearl-grey crown, with a cream-coloured line running through the eye to the back of the head. The cheeks are green; the neck, throat, and chin are creamy white, with a V-shaped black mark on the latter. The bill is bright orange with a brownish-grey nail, and the bill-processes are bright yellow. The cream-coloured breast is delimited abruptly from the remainder of the body, which is dull brownish-black, except for a large white patch just ahead of the tail. The wings are dark, marked by large white patches on the leading edge close to the body. In contrast, the female is

(Male.) King eider. (Female.)

simply a large light-brown bird with feathers marked and finely lined in black. The small amount of white on the wings, the size and shape of the bill, with processes extending toward the eye, are the best recognition features.

This big sea-duck nests across the entire northern coast and coastal islands of North America from northern Alaska to Greenland. Unlike the other eiders, it does not nest in colonies on small islands. Nests are widely scattered and situated close to shore-lines on large islands, or on the shores of the arctic mainland. The eggs are olive-buff in colour, and when left are covered with a grey down, darker in colour that that of the other eiders. Incubation and caring for the young falls to the female alone, the male joining large rafts of his fellows on the sea.

The king eider winters as far north as open water permits, but many migrate to the Atlantic seaboard, south often into the United States. It is not uncommon on the Great Lakes during the winter months, but in British Columbia the species is rare, having been recorded only twice—once at Port Hardy and once at Sooke.

The eiders are marine in habit, but this species nests farther inland than do the others. It has a circumpolar distribution, and from all reports is very numerous. Hersey, quoted in Bent (1925), writes that "no one who has not observed the migration of the king eider along the Arctic coast of Alaska can realize the enormous abundance of this species in the north."

As one would expect in such a marine species, the king eider feeds almost entirely upon animals such as molluscs, crustaceans, sea-urchins, and sea-anemones, although small amounts of eel grass and marine algæ are also eaten.

The adults winter farther north than do the immature birds, which take two years to attain full plumage. It is these young birds that are most likely to be seen along the British Columbia coast during the winter months. The plumage of the young male resembles that of the female, and in such plumage it is not so easily spotted, but the size and shape of the body, together with the processes running up from the bill, should enable the keen bird-observer to separate the king eider from our more common ducks.

Pacific Eider

The Pacific eider is a bird of the western Arctic. It breeds and winters on the Arctic Coast from the western portion of Victoria Island westwards around the coast of Alaska and through the Aleutian Islands. Those birds nesting in the far north migrate only to the Aleutians, thus the Pacific eider is seldom seen along the British Columbia coast. There are, however, two records—one from Port Hardy and one from Masset on the Queen Charlotte Islands.

The Pacific eider is the largest of all the North American ducks, resembling the northern and American eiders in appearance. The adult male has an orange bill sloping gradually to the forehead, with narrow processes extending almost to the eye on each side of the head. The forehead and crown are black, divided posteriorly by a white wedge-shaped mark. The nape of the neck is pale sea-green in colour, and a patch of the same colour is present on the side of the face. The cheeks, neck, and upper breast are whitish, and on the throat there is a distinctive clearly defined black "V"

Pacific eider.

(Male.) (Female.)

mark. The lower breast is buff-coloured and clearly defined from the black underparts and sides. The upper parts of the back and the scapulars are creamy white, and the rump is black. There is a large white spot on the flank just forward of the tail, and the wings of the drake show a large amount of white when the bird is flying.

The female is a brown-coloured bird, transversely barred in dark markings on the breast and flanks. There is very little white on her wing, just a border at the end of the secondaries and secondary coverts. Her very large size and the narrow processes running from the upper part of the bill almost to the eye will separate the female Pacific eider from our more common ducks.

This eider nests close to the sea. The female lays from five to ten olive-coloured eggs, similar to those of the other eiders. She covers them with soft grey down, and is said to be a devoted

mother. The male takes no part in the incubation or care of the young, going off to moult when the eggs are laid.

Like the king eider, this bird feeds almost entirely upon molluscs, sea-urchins, and crustaceans, taking only a small amount of vegetable matter, which is composed largely of marine algæ.

White-winged Scoter

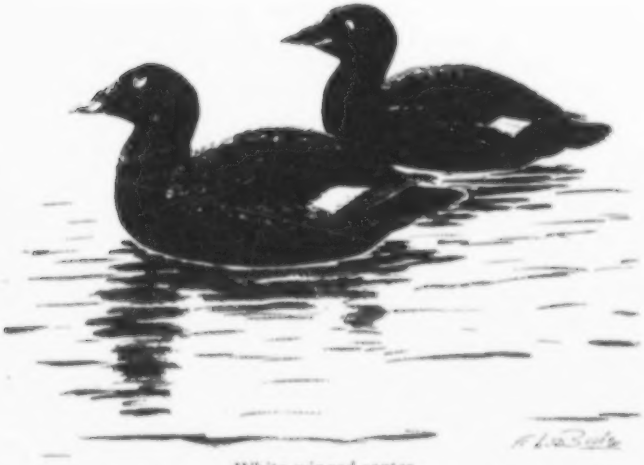
The white-winged scoter is the largest of our common ducks. The full-plumaged male and the female are black in colour, except for a broad white mark on the wing and small white markings on the face. In the male this facial mark is a small distinct comma-shaped patch extending back from the eye, and it is always present in adults. The adult female sometimes lacks white markings on the face, but occasionally one or two indistinct patches are present on the side of the head behind the eye.

In the distance this bird often appears completely black, as the white on the folded wing is sometimes hidden by the flank feathers. The plumage of the adult male is blacker than that of the female, in which a distinct brownish tinge may be seen on close inspection.

The upper mandible is swollen at the base, and in the male the side of the bill is purplish-red, shading to orange near the base and to white on the upper side. These colours are much reduced or lacking in the female, and very often her bill is simply dark, lightening somewhat on the upper side.

The white-wing nests over a large section of western North America extending from the shores of the Arctic in the region of the Mackenzie south into the northern United States and east to Lake Winnipeg.

In British Columbia it breeds in the Nicola region, the Cariboo parklands, in the Quesnel region, at Francois Lake, and at Atlin in the boreal forest, according to Munro and Cowan (1947). The white-winged scoter does not breed on the coast, though non-breeding individuals are present during the summer months. The nest is built in late June in a scraped-out hollow on the ground usually well concealed in heavy cover. It is made of sticks, grasses, and leaves, lined with down, and contains nine to fourteen pinkish-coloured eggs.



White-winged scoter.

(Male.) (Female.)

After nesting, birds appear on the sea in September and October; they winter along our Pacific shore-lines and migrate to the breeding-ground again in March and April.

This diving duck subsists largely on mussels, small clams, other shell-fish, and crustaceans; 94 per cent of the diet is made up of animal food. On the Pacific seaboard it is not considered as game, and very few water-fowlers shoot it. On the Atlantic, however, it is hunted to a far greater degree, and although rated as a poor table bird, many waterfowlers are said to pursue it avidly along the New England coast, where there is a large wintering population.

American and Surf Scoters

Of the three species of scoters—the American, the surf, and the white-wing—only the first named is without white markings, the adult male appearing as a large, totally black duck. Only the

American scoter.
(Female.) (Male.)

bright-yellow bulb at the base of the upper mandible breaks the monotony of its plumage. The adult female is dull dark brown in colour, except for the side of the head and throat, which is comparatively light and flecked with brown. The feet of both male and female are dark. These features make the American scoter easy to identify. Its size, bulky shape, total lack of white markings on the face, and the lack of white wing markings distinguish it immediately from both the surf and white-winged scoters. It may be separated from the former by the lack of white on the head; from the latter, by the lack of white on the wings.

The breeding range of the American scoter extends as a narrow belt along the coast of northern Alaska from the base of the Alaskan peninsula around to and including the Mackenzie delta. It winters on the sea along the Aleutian Islands and along the coastlines of southern Alaska, British Columbia, and northern Washington. There is a wintering population also on the Atlantic seaboard. In April and May the birds migrate to the breeding-grounds, moving south again in late September and October.

Kortright states that " the nests of this scoter are so well concealed and are built in localities so inaccessible that they are seldom found. It is said to lay from six to ten eggs which are light buff or pinkish in colour . . ."

Like the previous species, the surf scoter is without white on the wings, but the head, especially in the adult male, is so distinctively marked that little difficulty is encountered in recognizing this bird. The upper mandible, too, is distinctive, being elongated, swollen, and merging imperceptibly with the top of the head. It is highly coloured in orange and yellow on the upper side and is largely white at the base, with a prominent black mark superimposed over the white area. The margin between this black mark and the feathering of the head is red in colour. The plumage is black, apart from a prominent white patch on the forehead and on the nape.

The adult female is light below, dull brownish to slate on the sides and back. The head is darker than the body, with two indistinct white markings showing on the side of the face and one on the nape. The bill is swollen to a less extent than is that of the male and is without bright colouring.

The surf scoter nests in a wide area around the Mackenzie River from the 60th parallel north to the Arctic Ocean. It winters along the entire Pacific Coast from southern Alaska to southern California, and along the Atlantic seaboard of the United States as well. The main northward movement begins in late April and May, and in late September and October the birds return to the wintering-grounds. Like the previous species, the nest of this

Surf scoter. (Male above.)

bird is seldom found, due to the inaccessibility of the habitat and to the careful concealment of the nest. Apparently it nests in thick marshes that are unsafe to traverse on foot and where it is impossible to push a boat.

Both of these scoters live largely upon animal matter such as molluscs, crustaceans, insects, and sometimes even upon small fishes. Nine-tenths of the diet is made up of such items. It is sometimes hunted on the Atlantic seaboard, but scoters are not considered as game birds in the west.

Ruddy duck.

(Female.) (Male.)

Ruddy Duck

The ruddy duck is a small dumpy waterfowl measuring 15 inches in total length when fully stretched out. It is unique in having stiff spike-like tail feathers and practically no tail coverts. The bill is short, broad throughout its length, flared, and with a distinctive hooked nail at the tip.

In summer the adult male has reddish upper parts and sides; light, slightly barred underparts; and a distinctively marked head. The crown and nape are black, the cheeks white, and the bill bright blue in colour. In winter plumage the reddish colour is replaced by barred browns and greys, the bill is darker, and the shining

black crown and nape assume a dark-brown colour. In both summer and winter the female resembles the winter male but with barred cheek patches.

In British Columbia the ruddy duck nests throughout the interior in the summer months. It is more plentiful in southern areas, but ranges north to the Peace River parklands. There are also a few summer and nesting records for southern Vancouver Island. The winter range for the species extends from southern Vancouver Island and the lower mainland south along the Pacific seaboard, through Mexico, and along the Atlantic seaboard north to the 40th parallel. The large part of the continental population nests in the central interior of the continent.

The ruddy duck nests around sloughs where heavy cover, such as cat-tail and bulrushes, prevails. It builds a well-camouflaged basket-like nest in the dense cover growing from the water. From six to ten very large, dull whitish eggs are laid in May and June, and by July and August the downy young are about with their parents. Nests with eggs are often found in July and August as well as in May and June, which indicates that sometimes two broods are raised. Unlike most other ducks, the male, though not assisting in incubation, does remain with the female and takes part in raising the young.

The ruddy duck has an elaborate courtship display, and the male, in his antics, provides an interesting, though comical spectacle, as he puffs out his breast, slaps it smartly with his bill, and double kicks his way about on the pond with tail cocked and neck inflated. During courtship, females of many species of birds appear to ignore the male's display, but the female ruddy seems to appreciate it and often tries to duplicate her suitor's antics.

Ruddy ducks feed largely upon vegetable matter; about 75 per cent of the diet is made up of pond weeds, sedges, and other aquatic plants. Thus the flesh is very palatable, and where the ruddy is more numerous, waterfowlers seek them out.

Kortright (1942) writes: "What an amazing list of achievements the ruddy duck can claim! Even the conceited, pompous little drake should be satisfied with this record: (*a*) The male has two distinct plumages, one for summer and one for winter. (*b*) It

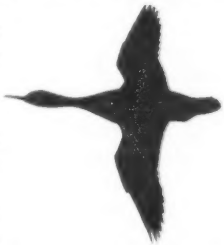
has the most spectacular of all duck courtship displays. (*c*) It has more local, alternative names than any other duck. (*d*) The male is the only duck of its sex that invariably assists in the raising of the young. (*e*) It is the only species of duck that raises two broods in one season. (*f*) Except for some of the eiders and scoters, the tiny female lays the largest of duck's eggs. (*g*) The male is the only duck that possesses an inflatable air-sac in the neck. (*h*) The male is the only duck that carries the tail erect. (*i*) The male is the only duck that has a truly bright blue bill. (*j*) Neither sex can walk on land. (*k*) They both are credited with the worst tempers imaginable. (*l*) It is rare for any female to be silent, but the female ruddy is."

MERGANSERS

American Merganser

Mergansers are fish-eating waterfowl characterized by narrow serrated bills, which has led to the common names "fish" duck and "saw-bill" duck.

The American merganser is the largest of the three species occurring in British Columbia. It measures about 2 feet from bill-tip to tail-tip. In full plumage the adult male is distinctly marked and easily identified by its dark greenish-black head and neck, red bill and feet, pinkish-white undersides and flanks, and by the black-appearing back. In flight the male American merganser appears largely white on the body and under-wing; in fact, it appears whiter than any of the other ducks, the pinkish tinge not showing at a distance and fading quickly in dead birds. Wings and wing coverts are largely black and white. Flight characteristics are also diagnostic—a long stretched-out appearance, everything in line from bill to tail, and a rapid wing beat serve in ready identification.



In the field the female is difficult to distinguish from the female red-breasted merganser. She is characterized by a crested rusty-brown coloured head and distinct white throat patch. The fore neck is coloured like the head and is clearly delimited from the white of the lower neck. Her back is grey, the underparts are white, the feet and bill are reddish, and the wings are like those of the male. The serrated bill will distinguish her from all other ducks except the female red-breasted, and from that species both male and female American mergansers may be distinguished by the following characteristics although these points are difficult to see and assess in the field. The basic differences listed numerically are:—

(1) In the American merganser the nostril is situated near the centre of the bill; farther back toward the base in the red-breasted.

American merganser.

(Female.) (Male.)

(2) Feathering on the head of the American merganser extends forward almost an equal distance on the sides of the upper and lower mandibles, whereas on the red-breasted the feathering extends farther forward on the upper mandible.

(3) Females in full plumage may be separated by the clearly defined throat patch, and line of demarkation between coloration of head and hind neck in the American merganser; less clearly defined throat patch and gradual blending of neck-line in the red-breasted. These features are of little use in identifying specimens in juvenile or worn plumage.

The American merganser breeds throughout the Province north to the tree limit. Females with broods may be seen all along the coast during the summer months, particularly along the rivers and streams. In the fall and winter months the coastal population increases as birds nesting in the interior migrate to winter along the sea-shore and coastal rivers.

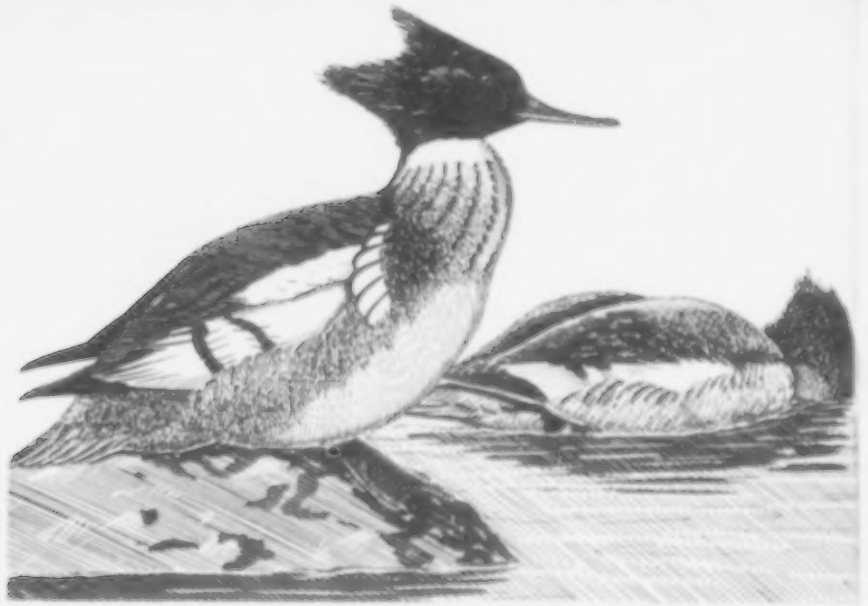
This bird nests in hollow trees, rock recesses, or on the ground close to water. From six to seventeen pale buff to ivory-coloured eggs are laid in late April and May, hatching after an incubation period of twenty-eight days. Young are then seen accompanied by the mother only, foraging along the waterways. Very often one or two of the downy young will ride on the mother's back, forming an attractive picture. When disturbed the mother and young appear to run rapidly on the water, aided by a vigorous flapping of the wings and a characteristic side-to-side waddle, all of which, though somewhat ludicrous, is very effective escape procedure, for it is surprising how quickly these family groups move out of range and out of sight.

The American merganser feeds upon small fishes, fish eggs, crustaceans, and aquatic insects, which are secured largely by diving.

Red-breasted Merganser

The adult male red-breasted merganser is characterized by a greenish-black head like the American, but with a distinct and prominent crest, and with a reddish band across the breast. Otherwise, it is somewhat similar in appearance but with some light areas marked in black (*see* illustration). All in all, this species is a smaller, more slender bird than the American merganser, measuring only 22 inches in total length and with a more slender bill. The differences between the female of this and the very similar female American merganser have been dealt with under the previous species. Both are crested reddish-brown headed birds, largely white below, greyish above, and almost inseparable in the field except under ideal conditions.

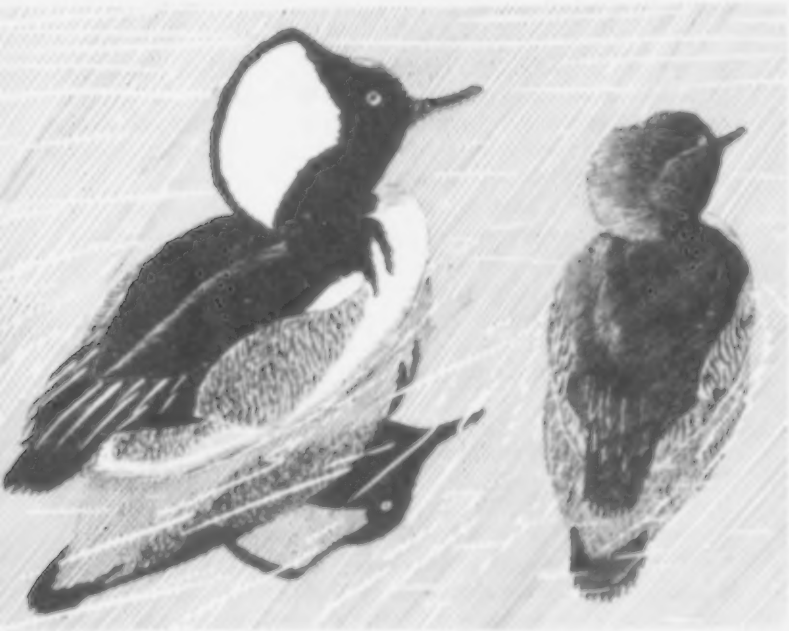
There are two nesting records for this species in British Columbia, both from the region of Atlin Lake, according to Munro and Cowan (1947). During the summer the red-breasted merganser is absent from the greater part of the Province, occurring only in the boreal forest biotic areas to the north. At other seasons it seems to be confined to the western side of the Province, wintering along the coast from the northern tip of Vancouver Island southwards to Mexico. Spring migration begins in March, and a small part of it passes along the western interior through the Cari-



(Male.) Red-breasted merganser. (Female.)

boo; the main migration, however, moves northward along the coast. In September and October, fall migration brings the wintering populations back down along the coast and, rarely, through the southern interior. On the Great Plains these birds are seen almost to the International Boundary throughout the summer months, and in Eastern Canada they occur farther south to the Great Lakes and eastward at those latitudes to the Atlantic seaboard.

Unlike the other mergansers, this species is not a tree nester, but builds a well-concealed nest on the ground, usually in dense cover close to the water. As with other waterfowl, the eggs are covered over by down plucked from the mother's breast. Usually from eight to ten buffy-olive coloured eggs are laid, hatching after an incubation period of twenty-eight days, and the young are very soon about with their parents. Strangely, with this species both male and female take part in raising the young and are said to be devoted parents. Apart from this species, the ruddy duck, and



Hooded merganser.

(Male.) (Female.)

occasionally the male cinnamon teal, the males of our other species of ducks do not habitually assist in raising the young.

The red-breasted, like the American merganser, feeds largely upon small fishes secured by diving, and for this reason is greatly disliked by trout fishermen. However, it has been shown that coarse fish in competition with game fishes are taken as well by mergansers; and often in proportionately larger numbers, so that in some instances the activities of these birds are beneficial.

Hooded Merganser

The hooded merganser is the smallest of three species occurring in British Columbia. The drake is easily recognized by its

prominent black and white crest, narrow serrated bill, and chestnut-coloured flanks. The female resembles the larger female mergansers in colour pattern, being brownish above, lighter below, and with a reduced reddish crest. Like her mate, however, she is much smaller (18 inches) and is generally darker in colour.

Despite the distinctive appearance of this small merganser, the novice sometimes confuses it with other species of small ducks—the male with drake buffle-head and wood duck, the female with green-winged teal.

This species favours small, quiet woodland ponds and slow-moving streams to a greater extent than do the others. It feeds less upon fish and more upon aquatic insects, molluscs, and crustaceans than do the larger mergansers, and, all in all, is a beneficial and beautiful bird. In British Columbia it occurs in the south-western half of the Province, nesting throughout that area wherever favourable habitat occurs. In the winter months it migrates along both Atlantic and Pacific seaboards, wintering on the latter from southern Vancouver Island south to Mexico.

The hooded merganser nests in hollow trees, in which it hatches a family of from ten to twelve young. The snowy-white eggs hatch after an incubation period of thirty-one days, and young may be found in the nest from May through July. The young tumble out of the nest in the late summer to forage as downy young with their mother.

Fulvous tree duck (male).

EXTRALIMITAL

Fulvous Tree Duck

The fulvous tree duck is a long-legged, long-necked bird of goose-like appearance and habit. The sexes are coloured alike, being for the large part tawny brown in colour. The feathers on the top of the head, on the back, and on the tail are darker than those on the body; white upper tail coverts add to the goose-like appearance.

This bird is a rather sedentary species, usually confined to southern California and Mexico. It has been recorded only once in the Province—at Alberni in September, 1905. As its occurrence here is purely accidental, the species has been placed on the extralimital list by Munro and Cowan (1947).

Steller Eider

The Steller eider is the smallest of the eiders, measuring only about 17 inches long. In full plumage the male is distinctly marked, with a white silvery head bearing a black eye spot, a green spot ahead of the eye, and a green crest on the nape. The throat is black, and there is a black collar around the neck which is continuous with the black of the back. Scapulars are white, with lanceolate black and white iridescent feathers extending back over the folded wing. The speculum is blue bordered fore and aft in white, somewhat like that of the mallard. Females are brown, with cross-barring on the face and breast. The only high colour she bears is the speculum, which is similar to that of the male.

The Steller eider is found north of the Aleutian chain of islands, with most of the population occurring on the Siberian side. It has been recorded once in British Columbia. The late Ronald Stewart took a specimen at Masset in October of 1948. (Racey, 1950.)

REFERENCES

Bent, Arthur Cleveland.

1923. Life Histories of North American Wildfowl. Bull. 126, U.S. Nat. Mus.

1925. Life Histories of North American Wildfowl. Bull. 130, U.S. Nat. Mus.

Kortright, Francis H.

1942. The Ducks, Geese and Swans of North America. The American Wildlife Inst., Washington, D.C.

Munro, J. A., and Cowan, I. McT.

1947. A Review of the Bird Fauna of British Columbia. Special Publ. No. 2, B.C. Prov. Museum.

Racey, Kenneth.

1950. The Steller Eider in British Columbia. Can. Field-Nat., Vol. 64, No. 1, p. 51.

Taverner, P. A.

1934. Birds of Canada. Bull. 72, Nat. Mus. of Canada.

Printed by Don McDiarmid, Printer to the Queen's Most Excellent Majesty in right of the Province of British Columbia.

1958

4M-1058-6255

HANDBOOK SERIES

of the

BRITISH COLUMBIA PROVINCIAL MUSEUM
DEPARTMENT OF EDUCATION, VICTORIA, B.C.

No. 1.	Fifty Edible Plants of British Columbia.	George A. Hardy.	25 cents.
No. 2.	The Amphibians of British Columbia.	G. Clifford Carl.	50 cents.
No. 3.	The Reptiles of British Columbia.	G. Clifford Carl.	50 cents.
No. 4.	Some Mushrooms and Other Fungi of British Columbia.	George A. Hardy.	
No. 5.	The Fresh-water Fishes of British Columbia.	G. Clifford Carl and W. A. Clemens.	
No. 6.	The Birds of British Columbia: (1) The Woodpeckers; (2) The Crows and Their Allies.	C. J. Guiguet.	25 cents.
No. 7.	The Barnacles of British Columbia.	I. E. Cornwall.	50 cents.
No. 8.	The Birds of British Columbia: (3) The Shorebirds.	C. J. Guiguet.	25 cents.
No. 9.	The Grasses of British Columbia.	W. A. Hubbard.	
No. 10.	The Birds of British Columbia: (4) Upland Game Birds.	C. J. Guiguet.	25 cents.
No. 11.	The Mammals of British Columbia.	I. McT. Cowan and C. J. Guiguet.	
No. 12.	The Ferns and Fern-allies of British Columbia.	T. M. C. Taylor.	50 cents.
No. 13.	The Birds of British Columbia: (5) Gulls, Terns, Jaegers, and Skua.	C. J. Guiguet.	25 cents.
No. 14.	Alien Animals in British Columbia.	G. Clifford Carl and C. J. Guiguet.	25 cents.
No. 15.	The Birds of British Columbia: (6) Waterfowl.	C. J. Guiguet.	25 cents.

Other publications of the Provincial Museum are:—

Annual Reports: Covering the activities of the Museum for each year.

Occasional Paper Series: Containing scientific papers in the fields of natural history and anthropology of the Province.

Anthropology in British Columbia Series: Reporting on activities in the field of anthropology for each year.

Special Publications: Containing material not included in the other series.

Copies of Museum publications may be obtained by applying to the Provincial Museum of Natural History and Anthropology, Victoria, B.C.